PLATFORM ON
SUSTAINABLE FINANCE

PLATFORM ON SUSTAINABLE FINANCE: TECHNICAL WORKING GROUP

PART B – Annex: Full list of Technical Screening Criteria

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This is a long report. Please think before printing.

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1. Agriculture, Forestry and Fishing

1.1 Animal production

Description of the activity

These criteria cover the raising (farming) and breeding of all animals, except aquatic animals.

In accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006, these activities are classified under the following NACE code:

NACE code 1.4 - includes raising of

- **01.41 - dairy cattle**;
- **01.42 - other cattle and buffaloes**;
- **01.43 - horses and other equines**;
- **01.44 - camels and camelids**;
- **01.45 - sheep and goats**;
- **01.46 - swine/pigs**;
- **01.47 - poultry**;
- **01.49 - other animals**
- **01.50 – mixed farming** (also covered under 'Crop Production' as explained in Rationale)

The criteria are applicable to animal production activities with integrated conservation and restoration as captured in the criteria below. An animal producer can alternatively use the criteria under 'Conservation of Habitats and Ecosystems' and / or 'Restoration of Habitats and Ecosystems' to assess conservation or restoration activity that can be separately distinguished from any animal production activity.

Substantial contribution to protection and restoration of biodiversity and ecosystems

Three ways have been identified in which the activity of animal production can make a substantial contribution to the protection and restoration of biodiversity and ecosystems (hereafter 'SC to B&E').

These are:

When it maintains or improves biodiversity via extensive grazing in habitats where grazing is beneficial for biodiversity AND ensures alignment in respect of a number of other aspects COMMON TO options A, B and C

When it promotes rare breeds AND ensures alignment in respect of a number of other aspects COMMON TO options A, B and C

When it ensures a sustainable farm-gate nitrogen balance AND ensures alignment in respect of a number of other aspects COMMON TO options A, B *and* C

The activity would need to satisfy only *one* of these options to be deemed to be making a SC to B&E, although of course it may satisfy more than one option.

Tables 1, 2 and 3 describe the criteria relating specifically to Options A, B and C respectively. Table 4 describes the criteria which apply to Options A, B *and* C (unless explicitly noted otherwise). Therefore:

To meet Option A, the activity must satisfy **all** the criteria described in Table 1 AND Table 4.

To meet Option B, the activity must satisfy **all** the criteria described in Table 2 AND Table 4.

To meet Option C, the activity must satisfy **all** the criteria described in Table 3 AND Table 4.

The only exception to this is where particular practices can be demonstrated to be not applicable to that farm holding given the particular biophysical conditions at that farm holding or nature of their operations e.g., If the animal production activity includes no grazing, the criteria relating to grazing regime will be not applicable.

Demonstrating compliance via a Farm Sustainability Management Plan (FSMP): A spatial and temporal FSMP sets out the agricultural holding's strategy to meet these Criteria, and acts as the documentation to evidence compliance. The FSMP:

Describes the holding's biophysical environment and cropping system, including information on land use change;

Identifies the management practices or other measures that ensure compliance with the criteria described below.

The FSMP incorporates and is informed by any assessments required to enable and/ or demonstrate compliance with any part of these criteria. At a minimum, this includes a Biodiversity & Ecosystem Impact Assessment that identifies and prioritizes the activity's contributions (historical and potential) to local/national habitat and species conservation priorities (based on the land, herd and other assets of the activity).

Record keeping: The agricultural holding keeps a yearly record of its performance, including information on the deployment of management practices to meet the criteria.

Verification: The information in the yearly records and the Farm Sustainability Plan is verified to be complete, correct and of high quality. That verification is carried out by an independent third-party body at the request of the agricultural holding at the beginning of the investment period and every three years thereafter.

Please note: criteria to identify when particular investments within the economic activity might be recognised as making a substantial contribution, even where the activity as a whole does not (yet) meet the activity-level criteria presented here, remain under discussion.

Do no significant harm ('DNSH')	
(1) Climate change mitigation	Permanent grassland is maintained. 1- Wetland and peatland are appropriately protected. 2- Arable stubble is not burnt, except where an exemption has been granted for plant health reasons. 3- Minimum land management under tillage, including on slopes. 4- Continuously forested areas, namely land spanning more than one hectare with trees higher than five meter and a canopy cover of at least 10% or able to reach those thresholds in situ1, are not converted.

[1] In accordance with Article 29, paragraphs 4 and 5 of Directive (EU) 2018/2001. This requirement applies to all perennial crop production, whether for biofuels, bioliquids or biomass, or for food or feed uses.

	5- No use of peat or peat containing product or material e.g., as growing medium, fertilizer, animal bedding, etc. The Farm Sustainability Management Plan identifies the management practices or other measures that ensure compliance with these criteria.
(2) Climate change adaptation	DNSH as set out in Appending A of Annex I to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.
(3) Sustainable use and protection of water and marine resources	DNSH as set out in Appending B of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852. AND 1- Where the activity involves water abstraction, a permit for water abstraction, where such is required, has been granted by the relevant authority for the activity, specifying conditions to avoid significant impact on water bodies. 2- Where the holding is located in an officially identified water stressed area, the activity's water use does not increase net catchment water exploitation compared to a baseline of immediately prior to the activity's commencement/cut-off date investment period. 3- Where the holding is located in a water stress area (defined as where: (1) the mineralization of the groundwater is already relatively high or increasing, and the extraction of additional water may have additional negative effect; and/or (2) the water resources of the area concerned have already been under stress and under monitoring for several years, with a volume of use greater than the natural recharge of the spring reserves), then no other water abstraction than water harvesting is considered.

	4- No livestock direct access to any natural watercourse, unless the specific grazing regime can be shown to be beneficial for threatened species or to control of invasive vegetation, on the basis of explicit guidance by a competent conservation authority. 5- No modification of water bodies, e.g., straitening of rivers, lining ditches, removal of riparian vegetation, etc. 6- The Farm Sustainability Management Plan identifies the management practices or other measures that ensure compliance with these criteria.
(4) transition to a circular economy	1- Activities should use residues and by-products and take any other measures to minimize primary raw material use per unit of output, including energy[2]. 2- Anaerobic digestion of organic material (excl. organic waste) is eligible provided that: (i) It is produced from the biomass feedstock listed in Part A of Annex IX of Directive (EU) 2018/2001, (ii) methane leakage from relevant facilities (e.g. for biogas production and storage, energy generation, digestate storage) is minimized in line with industry practice and is controlled by a monitoring plan, (iii) the digestate produced is used as fertilizer/soil improver – directly or after composting or any other treatment. The Farm Sustainability Management Plan identifies the management practices or other measures that ensure compliance with these criteria.

[2] The criterion refers to “unit of output” to allow for production efficiency increases where raw material use may not decline.

(5) Pollution prevention and control	DNSH as set out in Appending C of Annex I to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852. AND 1- For farms defined as intensive in the BREF for the Intensive Rearing of Poultry or Pigs[3]: Emissions are at least within the emission levels associated with the best available techniques (BAT-AEL) ranges set out in the best available techniques (BAT) conclusions for the Intensive Rearing of Poultry or Pigs 2- On the use of Active Pharmaceutical Ingredients (API): 2.1. Active Pharmaceutical Ingredients (API) used are registered, both for therapeutic and sub-therapeutic uses. 2.2. A pharmaceutical and antimicrobial management plan includes (1) prioritisation of APIs that has confirmed low impact on the environment; (2) reduction of the total use of API quantity to at least 25% in ten years. 2.3. Any API where the risk for the environment has been confirmed has been substituted for an available equivalent in pharmaceuticals properties that has a significantly lower impact on the water bodies and wildlife. Particularly, the non-steroidal anti-inflammatory Diclofenac must not be used[4].

[3] http://eippcb.jrc.ec.europa.eu/reference/irpp.html

[4] Diclofenac is a non-steroidal anti-inflammatory drug (NSAID) used with livestock. When vultures and other carrion eaters feed on a carcass, it poisons them – causing a 99% drop in Asian vulture numbers. Other alternatives that are non-toxic to carrion eaters are readily available. Diclofenac was licensed for use in Europe, in 2014. The potential impacts are great, particularly for small populations of vultures such as populations of Egyptian vulture in Italy (10 pairs) or France (80 pairs) – one carcass could contaminate a high proportion of the population due to their congregating in large groups to feed, even more so during migration. Other NSAIDs may also be toxic,

	The Farm Sustainability Management Plan identifies the management practices or other measures that ensure compliance with these criteria.

Rationale

The scope of activities selected

The production of all animal types per the NACE codes listed above are addressed here under one set of criteria for 'animal production' as there are significant commonalities in pressures to/ potential for improvements in biodiversity and ecosystems from the production of all of these animals, and hence significant commonality in the criteria required. Where some distinction is needed, this is noted in the criteria tables. For example, the criteria relating to supplementary feed vary by animal type.

For the purpose of the Taxonomy, **mixed farming** involves any operation with both animal and crop production. Crops grown in mixed farming can be grown either to feed livestock or for separate sale as a cash crop. It is important to note that recoupling of crops and livestock can lead to greater resource efficiency and reduced reliance on synthetic inputs, thus improving climate and environmental performance[5]. At the same time, if accompanied by productivity improvement on existing agricultural lands, mixed farming reduces the expansion pressure of agriculture into non cultivated/used land. However, while the recoupling of crop and livestock

and a watching brief should be maintained on those declared unsafe for vultures and other carrion eaters, and these should be avoided and safe alternatives used instead.

Herrero-Villar, M., et al. (2021). "First diclofenac intoxication in a wild avian scavenger in Europe." Science of the Total Environment 782

Oaks, J. L., et al. (2004). "Diclofenac residues as the cause of vulture population decline in Pakistan." Nature 427(6975): 630-633.

Birdlife (2020). Landmark policy resolution creates new hope for vultures. *https://www.birdlife.org/worldwide/news/landmark-policy-resolution-creates-new-hope-vultures*

Egyptian vulture numbers - https://www.4vultures.org/life-rupis/ (Accessed July 6th 2021)

[5] https://ec.europa.eu/eip/agriculture/sites/agri-eip/files/fg16_mixed_farming_final-report_2017_en.pdf

production is beneficial and feasible in many contexts, it is not a mandatory requirement of the Taxonomy.

However, mixed farming can be assessed under the Taxonomy. In assessing mixed farming operations, cropland production should be screened using criteria for growing of crops. Livestock production should be assessed according to the animal production criteria. I.e., the activity needs to meet the crop production criteria in respect of the crop production element, and the animal production criteria in respect of the animal production element.

The impact of animal production on biodiversity and ecosystems

Agriculture is one the largest contributors to biodiversity loss and its impact increases with the consumption of growing populations. Animal products represent the main hotspots of impacts on biodiversity together with land use for agriculture and climate change[6]. More specifically, animal production impacts on biodiversity and ecosystems through land conversion, crop, soil, nutrient, water, waste and energy management practices inherent in the feed, manure and housing systems. The most significant impacts include:

1. About 50% of the endemic plant species of Europe are dependent on the grassland biotope, 50% of bird species depend on grassland habitats for food and reproduction and vegetation provides habitats for arthropod populations.[7] But grazing intensification can lead to loss of protective ground cover, reduced water and nutrient capture efficiency, soil compaction and soil erosion, fouled watercourses, contaminated groundwater and weed invasion, livestock tramping, all leading to loss of species richness and fauna populations.[8]
2. The emissions of pollutants into soil, air and water courses and bodies – including but not limited to nutrient depositions from fertiliser leading to eutrophication and soil

[6] https://doi.org/10.1016/j.jclepro.2019.04.054

[7] Future of EU livestock sustainable agricultural sector final report.pdf P2 Executive Summary

[8] Almost all the world rangeland is degraded to varying extent due to excessive number of livestock and/or bad management. See for example: https://www.pnas.org/content/110/52/20900 showing biodiversity declines with intensification of livestock grazing

acidification, and the release of pesticides, pharmaceutical and hormones into water and soil.

3 The clearing or fragmentation of natural or semi-natural vegetation for animal production leading to the destruction and reduction of habitats and biome connectivity.

4 The removal or mismanagement of field structures, margins or other biodiversity valuable landscape elements leading to the destruction and reduction of habitats and biome connectivity.

5 Significant demand for additional land for crop production, to supply animal feed[9]

6 Other management practices harming biodiversity[10] – e.g., fencing disrupting wildlife movements, fire-stubble burning, soil degradation leading to loss of soil biodiversity.

7 The loss of genetic diversity of domesticated animals - with its focus on high-yielding breeds leading to almost 50 % of all European livestock breeds becoming extinct or assuming endangered or critical status.

8 Heavy, repeated yearly use by livestock without rest can promote exotic annual grass invasion by depleting native herbaceous vegetation, promote increase in woody vegetation.

9 Overuse of riparian areas.

Conversely, animal production can contribute to the improving biodiversity and ecosystems by creating or enhancing locally adapted high-biodiversity landscape features or areas, connecting biomes and providing habitats for flora and fauna.[11]

A substantial contribution

All of the options laid down in the section Technical Screening Criteria for substantial contribution represent a substantial contribution to the protection and restoration of biodiversity and ecosystems as under these options the activity both:

- Is carried out in a way that the pressures are halted or significantly reduced, which not just reduces ongoing negative impacts but also allows for the subsequent recovery of biodiversity and ecosystems; AND

[9] https://ourworldindata.org/global-land-for-agriculture

[10] While less of a problem in Europe, this is a significant problem in many parts of the world. See for example https://www.researchgate.net/publication/48855618_Invasive_Plants_on_Rangelands_A_Global_Threat

[11] Future of EU livestock sustainable agricultural sector final report.pdf P20

- Is actively creating or enhancing locally-adapted high-biodiversity landscape features or high biodiversity value areas.

They variously align with the following key elements of the EU Biodiversity Strategy:

- 25% of the EU's agricultural land must be organically farmed by 2030.
- At least 10% of agricultural area under high-diversity landscape features
- Reduce by 50% the overall use of – and risk from – chemical pesticides by 2030 and reduce by 50% the use of more hazardous pesticides by 2030, and
- The decline of genetic diversity must also be reversed, including by facilitating the use of traditional varieties of crops and breeds.

They are also consistent with the Farm to Fork[8] strategy (part of the European Green Deal) which highlights the urgent need to reduce dependency on pesticides and antimicrobials, reduce excess fertilisation (especially nitrogen and phosphorous), increase organic farming and reverse biodiversity loss. The introduction of sustainable criteria on agriculture may also contribute to strengthen food security in developing countries, as well as strengthen soil and plant carbon sinks globally.

N.B. A fourth potential option for a substantial contribution to biodiversity and ecosystems was identified but is not being separately pursued. This is described below as it may be of relevance for an extension of these criteria in the future.

Option A: **improving biodiversity via extensive grazing in landscapes where grazing is beneficial for biodiversity**

Grazing systems involve domestic livestock consuming vegetation (mainly grasses and herb layer) outdoors in order to convert vegetation to animal products such as milk, meat, wool, etc - often involving ungulates such as cattle, sheep and goats, but potentially other livestock such as foraging pigs, birds, rabbits, etc. Permanent grassland provides a wide range of ecosystem services such as hosting crop auxiliaries and pollinators, contributing to animal nutrition, soil conservation (erosion, water purification) and climate regulation (carbon sequestration). In addition, in some locations and circumstances, appropriate grazing can 1) maintain and improve the biodiversity values of grazed permanent grasslands and other semi-natural habitats, 2) prevent the degradation of natural grasslands and other semi-natural habitats which have intact natural grazing / disturbance regimes, 3) prevent negative impacts on adjacent ecosystems.

The criteria for this option aim to capture activities where:

a. The grazing system (rotating or continuous grazing, stocking density) is adapted to the agro-climatic conditions in order to balance quantity and quality (plant flora diversity) of the pasture production and maintain or improve biodiversity of the biome concerned.
b. The grazing system does not lead to overgrazing and ensure a sustainable utilization of the pasture by limiting losses associated with repeated trampling and refusals.
c. The system does not lead to change in the trophic state of the plant and animal communities and in the global nutrient cycles (i.e., the diffuse pollution and impact on aquatic ecosystems associated with nutrient run-offs into surrounding environment caused by excessive fertilization (nitrogen, phosphorous) (Basch et al. 2015) and other chemicals.
d. Mowing timing, frequency and movement is adapted to take account of breeding and rearing seasons and wildlife habitats within grassland.
e. The use of mechanical treatments to fight weeds is limited to limit negative impacts (i.e., amphibians, insects and arthropods, and the population declines leading to reduction of food availability for other vertebrate species) and should only be conducted outside of the breeding and rearing season.
f. The mechanical treatments are spot treatment type and not applied to the whole field, leaving places untreated. (e.g., for nests of early breeding birds).
g. Structurally diverse pastures are sustained by livestock to contribute to pollinator diversity (Hevia et al., 2016).[12]

Option B: Farming of rare breeds

About 17 % of the world‘s 8700 animal breeds (from 38 domesticated mammal and bird species) are classified as being at risk of extinction and 58% are of unknown risk status.[8] Farming of rare breeds makes a substantial contribution to B&E by promoting domestic animal genetic resources diversity and/or safeguarding threatened domestic biodiversity (e.g., when farming listed critical, endangered, and vulnerable species and strains)[9] and in many cases also contributes to wild biodiversity through grazing.

More specifically, farming of rare breed is notably suited for lower input farming systems and considered best animals for conservation grazing purposes. It further supports the preservation

[12] Key document template - Guideline (der.wa.gov.au)

of biodiversity linked to cultural heritage as well as the vitality and fertility or fitness that may be affected by modern inbreeding. Rare breeds are part of biodiversity themselves. Increased genetic diversity may also enhance the capacity of ecosystem to adapt to pest and disease outbreaks risks.[13]

Furthermore, the EU Biodiversity Strategy includes as one of its key elements the need to reverse the decline in genetic diversity, including by facilitating the use of traditional varieties of crops and breeds. The Rural development programme also supports "local breeds in danger of being lost to farming or preserve plant genetic resources under threat of genetic erosion"[10]

Option C: **Ensuring a sustainable farm-gate nitrogen balance**

Excessive nitrogen losses caused by agricultural production have significant negative effects on biodiversity and ecosystems. Eutrophication caused by excess nutrients (nitrogen as well as phosphorus) can result in increases in weeds and algae, reduced oxygen levels and subsequent biodiversity loss[10]. Excess reactive nitrogen leads to direct foliar damage of the plants as well as to harmful acidification. Especially problematic is the nitrogen excess to species and communities that are adapted to low nutrient levels or are poorly buffered against acidification. Evidence is strong that ecological communities respond to the accumulated pool of plant-available N in the soil and that because of this biodiversity has been in decline in Europe for many decades. Additionally, the exceedance of critical loads for nutrient nitrogen is linked to reduced plant species richness in a broad range of European ecosystems.[11]

Many EU Directives aim to tackle excess nutrients and their consequences. The EU Nitrates Directive (EU, 1991) aims to reduce water pollution by nitrates from agricultural sources and prevent pollution of ground and surface waters. The EU Water Framework Directive (EU, 2000) aims at protecting and restoring the quality of all inland and coastal waters across Europe, and the National Emissions Ceilings (NEC) Directive (EU, 2016) sets out to reduce emissions through commitments for Member States and for the EU for important air pollutants, including nitrogen oxides (NO_x) and ammonia, which are nitrogen compounds.[12]

[13] the-animal-welfare-and-environmental-benefits-of-pasture-for-life-farming.pdf (agricology.co.uk)

For the EU-Commission the reduction of nutrients losses is one of the major goals of the EU Biodiversity strategy to 2030 COM/2020/380. With it, it aims to reduce nutrient losses by at least 50%, while reducing the use of fertilisers by at least 20% by 2030[13].

At the end reducing nutrients such as nitrogen can only be implemented on the farm holding via balancing nutrient inputs with the outputs of the agricultural system[14]. The option developed here proposes a way with which farms have guidelines which lead to an effective and efficient use of nitrogen, minimizing losses.

A note for future application: This option has currently been developed for substantial contribution to biodiversity and ecosystems but is equally applicable to the substantial contribution of sustainable use and protection for water and marine resources and substantial contribution to pollution prevention and control – as the balanced nitrogen fertilization tackles the overall reduction of nitrogen emissions.

Approach to setting the criteria

The tables below present a number of criteria that must all be met in order for the activity to be recognized as making a substantial contribution to the protection and restoration of biodiversity and ecosystems. These criteria cover a range of management aspects relating to the animal, land, soil, water, waste, agricultural infrastructure and other assets underpinning the animal production activity taking into account the myriad ways animal production impacts on biodiversity and ecosystems as described above. Criteria marked with a '^' represent safeguard levels of performance. Together, as a bundle, compliance with these practices would demonstrate a substantial contribution to the protection and restoration of biodiversity and ecosystems.

Most of these practices are described in qualitative terms, though some have quantitative thresholds. Preference has been given to the inclusion of quantitative thresholds where available and usable at farm level, with supporting scientific evidence provided.

The intention has been to set base criteria that are not reliant on local regulations or standards, that can be interpreted in all locations and contexts globally, and use globally recognised terminology. Once these criteria are established, then existing regulations or legislation, or labelling or certification schemes used in the industry can be evaluated for compliance with these base criteria. Where compliant, that regulation, scheme or other would then represent

an established ‘proxy indicators’ for all or part of these criteria, increasing the usability of the criteria.

This process has been started here, with the DNSH criteria taking guidance from, and looking to build on, the cross-compliance measures of the Common Agricultural Policy (CAP), and in particular the current proposals for the post-2020 CAP per Annex III of COM(2018)392. When that regulation is enacted, cross references will be added from these criteria to the relevant article in the regulation.

Selection of the Criteria

Scientific literature identifies a wide range of possible practices available in the agricultural sector to address the impacts of animal production on biodiversity and ecosystems. For the purpose of establishing a set of criteria and thresholds which identify when animal production delivers a substantial contribution to biodiversity and ecosystems, individual criterion were identified for which: 1) there is sufficient existing scientific knowledge and consensus on the mitigation effects; and 2) the scale, certainty and consistency of effects is sufficiently demonstrated.

It is noted that the scientific literature provides limited guidance on what combination of criteria should be applied together as a minimum at farm level in different conditions to deliver a substantial contribution to biodiversity and ecosystems. Given the heterogeneity of agriculture, it is especially challenging to establish a set of one size fits all criteria. However, it is the view of the majority of the group that these criteria are globally relevant, with the in-built flexibility on options for demonstrating compliance, they can be applied globally. To assist with this, the criteria are not tied to specific EU regulations, though cross-reference will be made where appropriate to those regulations to assist EU users.

With that in mind, the tables below indicate the requirements selected as a 'bundle’ of criteria that, deployed collectively, should deliver a substantial contribution with relatively high certainty across a range of biophysical and farming conditions. It is noted that given heterogeneity of farms, deployment of the same bundle of criteria may result in different impacts farm to farm, but overall, it is expected that deployment of this bundle will deliver a substantial contribution in the majority of cases. It will, of course, be necessary to regularly review these criteria to integrate new advances in scientific knowledge.

Supporting evidence for each of the criteria is given in Tables 1, 2, 3 and 4.

Recommendations for future consideration for future phases of criteria development

The following option was discussed and believed to have merit in terms of delivering a substantial contribution to Biodiversity and Ecosystems.

Insect farming

Studies have indicated the potential of insect farming and consumption. E.g., Insect farming results in fewer greenhouse gas emissions, requires less water and space, represents a much lower economic investment, and has a higher efficiency in the feed conversion rate relative to conventional livestock agriculture (Müller et al., 2016). According to the FAO, entomophagy offers great potential for a sustainable nutrition (van Huis et al., 2013). This is due to the high feed conversion efficiency of insects and their ability to feed on a wide variety of feed sources, as well as lower greenhouse gas emissions compared to conventional livestock farming. In terms of water use, the production of insects also offers advantages over meat production from industrial livestock farming (van Huis et al., 2013). Two areas with huge potential are (i) using insects as 'converters' of non-nutritive or unsafe foods; and (ii) using feed crops to enhance local biodiversity. The first uses insects to convert agricultural or industry by-products into human or livestock food. The second approach examines how specific feed crops for insects can be grown while simultaneously considering their effect on native biota. Flowering feed crops can be used to promote local pollinator diversity, with research focussing not only on the types of crops that would be beneficial, but also how different crop harvest times interact with feed quality and ecosystem services. Berggren et al., 2019

However, although entomophagy is considered to be sustainable, the environmental impact of industrial production systems for edible insects has so far been little studied. The exact nature of its environmental benefits is uncertain because of the overwhelming lack of knowledge concerning almost every aspect of production. Species have different feed, housing requirements, and life histories; while the location of the industry will influence how insects are housed, the feed crops available, and the environmental risk of accidental release. The risk of commercial insect species becoming locally invasive should not be easily discounted, especially since the cost of invasive species to natural and production systems are enormous. Furthermore, many insects, especially those considered useable for insect farming, have short life spans and short development cycles that can cause rapid dispersal once released in natural ecosystems. The precautionary principle should be exercised regarding non-native species, unless there is solid scientific evidence to suggest otherwise, especially with climate

change making the establishment and spread of many non-native species more likely. (Berggren et al., 2019) For this reason, this option has not been prioritised at present.

Table 1: Criteria for Option A only: GRAZING IS BENEFICIAL TO BIODIVERSITY

Criteria	Rationale
1. Eligible grazing	
1.1 At least 50% of the holding is under one of the following land uses: **A) Biodiverse permanent grassland[14].** These are composed of perennial or self-seeding native annual forage species which may persist indefinitely, may be natural (e.g., savannah, steppe, pampas, prairie, etc) or semi-natural (e.g., alpine meadows, dehesa, hay meadows) and can include agro-silvo-pastural systems of high biodiversity such as	Many biodiverse grasslands are managed through livestock grazing, without which they may cease to be biodiverse grasslands (for instance, reverting to forest, or becoming dominated by more competitive herbaceous species). Therefore, these criteria cover high biodiversity agroecological grassland systems in which grazing is required to maintain high biodiversity characteristics.

[14] Biodiverse grassland, as defined in Dir: 2018/2001. Article 29:3, definitions of land of high biodiversity value:

(i) natural, namely grassland that would remain grassland in the absence of human intervention and that maintains the natural species composition and ecological characteristics and processes;

or

(ii) non-natural [we prefer the more widely used, less confusing term, 'semi-natural]', namely grassland that would cease to be grassland in the absence of human intervention and that is species-rich and not degraded and has been identified as being highly biodiverse by the relevant competent authority

This is consistent with other definitions of 'natural' and 'semi-natural grassland', e.g., Allen e*t al 2011.*

Permanent grassland: "permanent grassland and permanent pasture" (together referred to as "permanent grassland") means land used to grow grasses or other herbaceous forage naturally (self-seeded) or through cultivation (sown) and that has not been included in the crop rotation of the holding for five years or more". REGULATION (EU) No 1307/2013 (CAP direct payments), Article 4, 1h.

Allen *et al.,* 2011. An international terminology for grazing lands and animals. Grass and Forage Science.

dehesa/montado and traditional tall fruit tree orchards with natural vegetation soil cover, but must be: - Minimum 5 uninterrupted years unploughed; and - Species rich, natural species composition, identified as high biodiversity by competent authorities. Eligible permanent grassland is defined by reference biome (e.g., WWF Bioregions or other world-mapping) or more detailed national historical data. For types of biodiverse European grasslands dependent on agriculture, see Halad et al., 2011[15] Excluded from this are: i) Biodiversity poor seminatural grasslands resulting from the historic degradation of higher value ecosystems e.g., Madagascan seminatural grasslands that follow deforestation, hill farming (sheep) when resulting in low floristic diversity in lieu of forest as in much of the British Isles.	Other systems or habitats which cannot be grazed without damaging biodiversity are excluded. There are some other biomes, not grasslands per se, which may benefit from grazing – for example Scandinavian forests and reindeer grazing. A measure is included to enable the inclusion of such systems provided compelling evidence, endorsed by conservation authorities, is presented of a non-grassland ecosystem requiring grazing to maintain high biodiversity. For guidance on farming and the management of Natura 2000 sites within Europe, see EC 2018 [16].

[15] Halad *et al.,* 2011. Which Habitats of European Importance Depend on Agricultural Practices? Biodiversity and Conservation. · See. Table 1, twelve biotopes of which are natural and semi-natural grassland formations (6120, 6150, 6190, 6240, 6250, 6260, 6280, 62A0, 62C0, 62D0, 6430, and 6440)

[16] EC 2018. Farming for Natura 2000 Guidance on how to support Natura 2000 farming systems to achieve conservation objectives, based on Member States good practice experiences. Management practices likely to be relevant are covered pp.42-46.

ii) Natural grasslands not yet exploited by livestock and with intact grazing regimes of wild grazers (for instance savannah, steppe, prairie, pampa etc) so as to avoid disrupting naturally intact ecosystems. OR **B) Qualifying habitats beyond permanent grassland** Non grassland habitat such as forest, scrubland, wetlands etc when compelling evidence is produced that grazing is necessary to maintain high biodiversity characteristics. Such evidence should be based on guidance by competent conservation authorities and the Farm Sustainability Management Plan should specify the biodiversity objectives pursued (e.g., control of invasive species, maintenance of a % of herbaceous vegetation, fuel load reduction etc). OR **C) Land managed for threatened and endangered species under an official conservation scheme** (for examples, see EC 2018).	

1.2. Pesticides are used only under exceptional circumstances to tackle invasive species, and in any case follow Integrated Pest Management principles in line with EC Regulation 1107/2009. “Candidates for substitution’ are not used.	

Table 2: Criteria for Option B only - FARMING RARE BREEDS

1. Activity is focused on a qualifying rare breed	
1.1 Either, more than 50%* of the animals farmed are from pure breeds per the following three definitions, OR more than 20% of the animals farmed today are from pure breeds per the following definitions but the farm plans to be above 50% within 5 years. Qualifying breeds: Are part of national species and breed development strategies and programmes and reported locally or regionally at risk through the Domestic Animal Diversity Information System (DAD-IS) of the FAO OR	If >50% then main occupation is farming of rare breed, even if you have non-rare breeds as well. The option to allow for a limited time period to reach this threshold has been included as building up rare breed holdings can take a substantial amount of time but is something that should be recognised and in doing so incentivised.

Are recognised as at risk based on global classification system E.g., FAO classifications of risk levels[17] OR Are below the thresholds for endangered breed set in Annex IV of the de Commission Regulation (EC) No 1974/2006 * These thresholds can be reached across a number of different rare breeds and different species. **1.2. The breed does not create the threat of invasive species** (animals or plants) **1.3. Genetic variability is managed by limiting the increase of inbreeding** **1.4. The breed is part of only stable cross-breeding programmes that involve the maintenance of pure-bred herds or flocks of local breeds**. Cross-breeding is tolerated If it does not extend of genetic dilution caused by indiscriminate cross-breeding	

[17] http://www.fao.org/tempref/AG/Reserved/DAD-Net/Groeneveld2010.pdf

1.5. The breed is not from cloned animals	

Table 3: Criteria for Option C only – ENSURING SUSTAINABLE FARM-GATE NUTRIENT BALANCE

Criteria	Rationale
1. Ensure balanced fertilization and efficient use of nitrogen	
1.1. N-Surplus limits: The agricultural holding must show annually that over a rolling average of three years: • the N-surplus from mineral fertiliser does not exceed 30 kg N/ha/a, • the total N-surplus from mineral fertilizer and organic matter does not exceed 90 kg N/ha/a, • the N-surplus from organic matter is never above the allowed limit which increases depending on N-org excretion produced at or imported to the farm (see Figure 1) [18].	*The farm-gate balance* Setting a limit for the nitrogen surplus on farm-scale instead of limiting the permitted amount of applicable nitrogen in fertilizers or setting a limit for nitrogen calculated by a soil balance provides the farmer with the flexibility to manage nitrogen within all their farming operations flexibly, to optimize nitrogen use at every point of the usage and use it according to her needs and economic criteria. It also prevents pollutions swapping which can happen when nutrients are poorly managed at animal housing stage, leading to a lower nutrient supply for the agricultural area. A mismanagement which would not be

[18] This means for example that with a prevalent manure of 60 kg N, the allowed surplus of the farm from any N (mineral or organic) is 60kg.

This to be demonstrated with the support of a digital tool that is accepted by the EU, national or regional bodies or in written form.

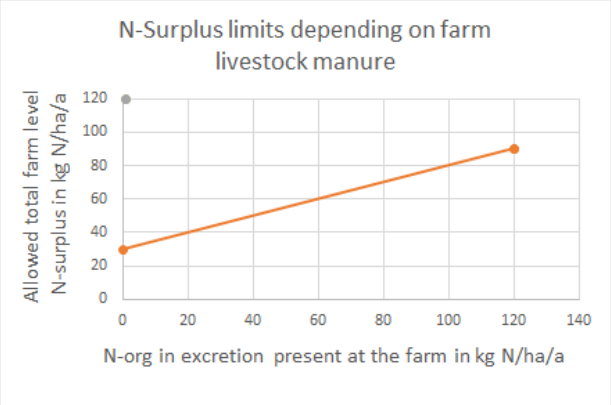

Figure 1: Defining the permissible N-surplus limit at farm level (measured with the farm nitrogen surplus, see text), depending on prevalent livestock excretion on the farm, measured in kg N/ha/a in manure.

accounted for with the application limit nor with a soil balance limit. The farm gate nitrogen balance is also designed in a way that it can be applied by crop farms without animals, mixed farms or animal farms without cropping area when they can prove that manure is applied according to the here defined principle. Several studies consider the farm gate nitrogen balance indicator the most integrative and transparent indicator in nutrient management[27] [28] [29].

Additionally, other indicators, such as e.g., the farm nutrient use efficiency (NUE) can be deduced from the farm nitrogen balance [30]. Complying with farm nitrogen balance limits has been made obligatory by Germany[31], Romania and Switzerland so far as a tool to implement the Nitrate Directive

[27] Oenema, O.; Kros, H.; de Vries, W. Approaches and uncertainties in nutrient budgets. Implications for nutrient management and environmental policies. Eur. J. Agron. 2003, 20, 3–16. [Google Scholar] [CrossRef]

[28] Bach M and Frede H-G 2005 Assessment of agricultural nitrogen balances for municipalities—example Baden-Wuerttemberg (Germany) Eur. Water Manage. Online 1–15

[29] SRU 2015 Stickstoff: Lösungsstrategien für ein drängendes Umweltproblem: Sondergutachten Sachverstaendigenrat für Umweltfragen (Berlin: Hausdruck)

[30] Löw P, Karatay Y N and Osterburg B 2020 Nitrogen use efficiency on dairy farms with different grazing systems in northwestern Germany Environ. Res. Commun. 2 105002

[31] Stoffstrombilanz – German legislation on farm budget implementation (https://www.gesetze-im-internet.de/stoffbilv/StoffBilV.pdf

1.2. Minimum Nitrogen Use Efficiency: Each farm holding utilizes nitrogen at least with a minimum NUE (Nitrogen Use Efficiency) as follows: NUE crops: 70% NUE granivores: 40% NUE ruminants: 30% To be demonstrated with the data collected in its farm-gate balance sheet. Notes: • NUE is defined here as the ratio of total N output in products of a farm and total N	and to reduce nutrient surpluses[32]. The use of farm nutrient budgeting such as the farm gate nitrogen balance as agri-environmental indicator is well established and has been highlighted by OECD and EU[33] [34]. There is also evidence that the farm gate indicator is able to indicate well that high nitrogen surpluses lead very often also to high nitrogen concentrations in groundwater. Hansen et al. (2017) [35] found significant correspondence between developments in N surplus and nitrate concentrations in upper groundwater for four subsequent development periods for Danish agriculture in the period 1946–2012. Dalgaard et al. (2012)[36] calculated gross farm budgets for six European landscapes in Poland, the Netherlands, France, Italy, Scotland

[32] Klages S, Heidecke C, Osterburg B, Bailey J, Calciu I, Casey C, Dalgaard T, Frick H, Glavan M, DHaene K, Hofman G, Amorim Leitão I, Surdyk N, Verloop K, Velthof G (2020) Nitrogen surplus - A unified indicator for water pollution in Europe? Water MDPI 12(4):1197)

[33] Eurostat and OECD (2013): Eurostat Nutrient Budgets—Methodology and Handbook, Version 1.02.

[34] EEA (2005): Agriculture and Environment in EU-15—The IRENA Indicator Report. Agriculture and Environment. p. 128. Available online: https://www.eea.europa.eu/publications/eea_report_2005_6.

[35] Hansen, B.; Thorling, L.; Schullehner, J.; Termansen, M.; Dalgaard, T. Groundwater nitrate response to sustainable nitrogen management. Sci. Rep. 2017, 7, 1–12. [Google Scholar] [CrossRef]

[36] Dalgaard, T.; Bienkowski, J.F.; Bleeker, A.; Dragosit, U.; Drouet, J.L.; Durand, P.; Frumau, A.; Hutchings, N.J.; Kedziora, A.; Magliulo, V.; et al. Farm nitrogen balances in six European landscapes as an indicator for nitrogen losses and basis for improved management. Biogeosciences 2012, 9, 5303–5321. [Google Scholar] [CrossRef]

inputs: NUE = [Σ(N output) / Σ(N input)] * 100 (see Table 1). • Farms that produce more than one product type must apply a weighted minimum NUE. This weighted NUE is calculated by multiplying the share of the N-output of the farm with the according NUE and summing the numbers up. (For example, if a farm produces 50% ruminant products and 50% granivore products, the resulting weighted NUE would be 35% (0.5*30%+0.5*40%)). • In order to take into account the additional N used to produce feed, the imported N in feed on the input side must be multiplied with 2 (see methodological notes d). **1.3. Combining Minimum NUEs with surplus limits** Each farm must show that its surplus is below the limits defined in 1.1 and that its NUEs are above the NUEs defined in 1.2. To give an example, a cropping farm produces 170kg wheat with 200kg mineral fertilizer. This farm has an NUE of 85% which is well above the NUE of 70% and a surplus of 30kg N/ha/yr from mineral fertilizer, which is also in the permitted surplus range.	and Denmark as an indicator for N losses. The authors found significant correlations of N surplus to both nitrate concentrations in soils and groundwater). Additionally, the indicator is able to catch also ammonia emissions, which are also an important source of eutrophication. *Defining minimum NUE limits* In order to ensure that all farms considered in this criterion do not only have environmentally acceptable low surpluses, but also a productivity which ensures an efficient use of nitrogen (NUE), we are defining minimum levels of nitrogen use efficiency. This approach, of combining an N-surplus limit with NUE, has also been proposed by the EU Nitrogen Expert Panel (EUNEP)[37] (See Figure 2) for examining the performance of the farm management.

[37] Nitrogen Use Efficiency (NUE) - an indicator for the utilization of nitrogen in agriculture and food system http://www.eunep.com/reports/

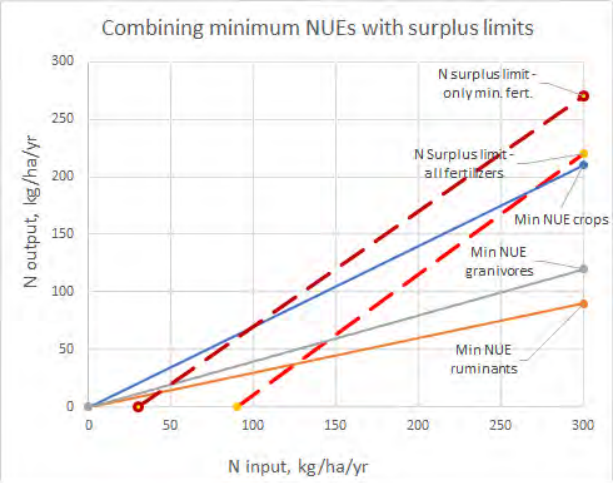

Figure 3: The possible fertilization range for the farms is the area above the surplus limit and the NUE-line. This is an exemplary figure as NUEs depend on the specific product typ. Dashed lines are allowed surpluses for total fertilization and mineral fertilization only (see figure 1). Straight lines are indicative NUEs for the three types of products (crops, granivores, ruminants).

1.4. Application limit for organic fertilizer: The agricultural holding must show that the yearly quantity of organic fertilizer applied does not exceed:

120 kg N/ha for cropping land

140 kg N/ha for grassland land

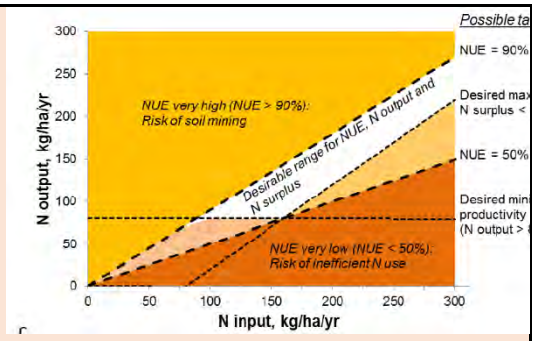

Figure 2: The NUE-Approach developed by the EUNEP. Lower and upper bounds for NUE values, a minimum N yield level and a limit for N surplus are defined to find the optimal values for N-input and N-output (white area). We are not including the productivity in our approach as the range for N-yield levels is too wide to find a general value. Source: http://www.eunep.com/reports/

In order to adapt the EUNEP-methodology to different farm types, we set minimum NUE-limits for crops, ruminants and granivores and defines surplus limits depending on manure excretion (see Figure 1). The NUE minimum limits are derived from the lower boundaries of values given by the EUNEP[38] for balanced N-fertilization as

[38] http://www.eunep.com/wp-content/uploads/2017/03/Report-NUE-Indicator-Nitrogen-Expert-Panel-18-12-2015.pdf

This application limit applies for each ha and is not averaged over the UAA of the farm. *Methodological notes:* *a) Measuring the farm gate nitrogen balance* The farm gate nitrogen balance (equivalent to the farm N surplus defined by EUNEP) per unit area (kg N/ha/a) is the difference between nitrogen inputs and nitrogen outputs per unit area to and from the farm. The nitrogen output is calculated from the total amount of products and the N content of the products exported from the farm (crop and animal). The nitrogen input is calculated from the total amount of inputs and their N content in a production year[19]. *b) Inputs and outputs that must be accounted for* Nitrogen input Nitrogen output	well as from a recent paper by Hutchings et al (2020)[39] which calculated typical NUEs for different farm types in Northern and Southern Europe. We are abstaining from using minimum productivity levels (as also suggested from EUNEP), as productivity varies enormously between different crops as well as livestock products and we would have to define too many different productivity levels. *Setting tailored limits for different farm types* The method for defining the sustainable limit for farm gate nitrogen surpluses depending on the prevalent manure on the farm and limiting the surplus for mineral fertilizer has been derived from the currently discussed proposition of German legislation on an improved farm gate balance implementation[40].

[19] EU Nitrogen Expert Panel (2016) Nitrogen Use Efficiency (NUE) – Guidance document for assessing NUE at farm level. Wageningen University, Alterra, PO Box 47, NL-6700 Wageningen, Netherlands. http://www.eunep.com/wp-content/uploads/2019/09/NUE-Guidance-Document.pdf

[39] Nicholas J. Hutchings, Peter Sørensen, Cláudia M.d.S. Cordovil, Adrian Leip, Barbara Amon, Measures to increase the nitrogen use efficiency of European agricultural production, Global Food Security, Volume 26, 2020, 100381,ISSN 2211-9124, https://doi.org/10.1016/j.gfs.2020.100381. (https://www.sciencedirect.com/science/article/pii/S2211912420300353)

Taube, F; Bach, M; Breuer, L; Ewert, F; Fohrer, N; Leinweber, P; Müller, T; Hubert, W (2020): *Novellierung der Stoffstrombilanzverordnung: Stickstoff- und Phosphor-Überschüsse nachhaltig begrenzen. Fachliche Stellungnahme zur Novellierung der Stoffstrombilanzverordnung. Texte 200/2020. Umweltbundesamt. Dessau-*

– Mineral fertilizers – Imported feed (multiplied with the inverse NUE of the feed production if known OR with a factor of 2)[20] – Biological nitrogen fixation – Seed and planting material – Bedding material (straw, saw dust) – Atmospheric N deposition – Imported animals – Imported compost and sewage sludge and other organic fertilizer	– Crop products – Exported animals – Animal products (milk, egg, wool) – Exported feed – Exported compost and sewage sludge and other organic fertilizer – Exported animal manure [22] – Exported digestates *	The reason for such an approach is the importance of the efficient use of organic fertilizer. Mineral fertilizer has an important role in feeding the global population and it can be used with smaller surpluses than organic fertilizer, but its easy availability reduces the efficient use of organic fertilizer. In regions with high livestock densities, farmers are often faced with the problem of an oversupply of manure which they have difficulties to apply on farmland according to legislation. Brink et al. 2011[41] have shown that in areas with high livestock densities manure N can even have a negative economic value. The problem of inefficient use of fertilizers can be seen when comparing nitrogen efficiencies with surpluses in different regions. In the EU, the efficiency of N-use is less than 50% in countries with an N surplus above 80 kg/ha/yr (the Netherlands, Belgium,

Roßlau. Download unter: https://www.umweltbundesamt.de/publikationen/novellierung-der-stoffstrombilanzverordnung

[20] See below for an explanation.

[22] Analysis of the nitrogen content of a representative manure sample of the bulk of the material from which it is taken has to be conducted in a regular basis. Rules for that are determined in the measure for the fertilizer plan.

[41] *Brink, C., van Grinsven, H., Jacobsen, B.H., Rabl, A., Gren, I.-M., Holland, M., Klimont, Z., Hicks, K., Brouwer, R., Dickens, R., Willems, J., Termansen, M., Velthof, G., Alkemade, R., van Oorschot, M., Webb, J., 2011. Costs and benefits of nitrogen in the environment, in: Sutton, M.A., Howard, C.M., Erisman, J.W., Billen, G., Bleeker, A., Grennfelt, P., van Grinsven, H., Grizzetti, B. (Eds.), The European Nitrogen Assessment. Cambridge University Press, Cambridge, pp. 513–540. https://doi.org/bh59rj*

– Imported animal manure [21] – Irrigation water – Imported digestates * *Table 1: List of in- and outputs in the balance* * Anaerobic digestates are not included in the EUNEP document but can contribute substantially to nitrogen surpluses and need therefore be integrated. Factors of N-content in digestates need to be obtained regionally. If this is not possible, we recommend for calculation for digestates from energy plants only a N-content of 0,85% and for digestates from organic manure and energy plants (50/50) a N-content of 0,71%[23]	Denmark and UK), between 50% and 70% in countries with an N surplus between 50–80 kg/ha/yr and more than 70% in countries with an N surplus below 50 kg/ha/yr, except for Portugal and Spain[42]. Globally, it is estimated that about 57% of anthropogenic nitrogen fixation results from the manufacture of nitrogen containing fertilizers[43]. This large amount must be reduced as it comes as additional input into the nitrogen cycle. An additional problem is the high energy demand of the industrial manufacturing of reactive nitrogen, which uses approximately 2% of world energy[44]. *The surplus limits*

[21] Analysis of the nitrogen content of a representative manure sample of the bulk of the material from which it is taken has to be conducted in a regular basis. Rules for that are determined in the measure for the fertilizer plan.

[23] https://www.ktbl.de/webanwendungen/wirtschaftlichkeitsrechner-biogas

[42] OECD (2006). Key Environmental Indicators. OECD Environment Directorate, Paris, France. http://www.oecd.org/dataoecd/32/20/31558547.pdf

[43] Erisman , J. W. , Domburg , N. , de Vries , W. et al. (2005). Th e Dutch N-cascade in the European perspective. Science in China, Series C, Life Sciences, 48, 827–842.

[44] Sutton M.A., Bleeker A., Howard C.M., Bekunda M., Grizzetti B., de Vries W., van Grinsven H.J.M., Abrol Y.P., Adhya T.K., Billen G.. Davidson E.A, Datta A., Diaz R., Erisman J.W., Liu X.J., Oenema O., Palm C., Raghuram N., Reis S., Scholz R.W., Sims T., Westhoek H. & Zhang F.S., with contributions from Ayyappan S., Bouwman A.F., Bustamante M., Fowler D., Galloway J.N., Gavito M.E., Garnier J., Greenwood S., Hellums D.T., Holland M., Hoysall C., Jaramillo V.J., Klimont Z., Ometto J.P., Pathak H., Plocq Fichelet V., Powlson D., Ramakrishna K., Roy A., Sanders K., Sharma C., Singh B., Singh U., Yan X.Y. & Zhang Y. (2013) *Our Nutrient World: The challenge to produce more food and energy with less pollution.* Global Overview of Nutrient Management. Centre for Ecology and Hydrology, Edinburgh on behalf of the Global Partnership on Nutrient Management and the International Nitrogen Initiative

c) In case that manure is imported to a farm or exported from a farm, the losses that occur during management (storage or housing) of the manure are attributed to the exporting farm and losses that occur during application are attributed to the importing farm. d) *Defining a factor for feed imported to the farm* In the case of livestock production, we comprise with the farm-gate balance approach two systems with different boundaries[24]. A farm which imports all or part of its feed has a comparatively lower N-input in the balance than a farm that would produce the same feed completely or partly on its own land[25]. In order to take account of the required N for the production of this feed and not to disadvantage mixed livestock farms over landless livestock farms, nitrogen imported via feed must be multiplied by the inverse NUE of the feed production if known OR with a factor of 2 (this means a conservative NUE of 50%, taking into account potential losses).	The different values for the nitrogen surplus limits leading to environmentally acceptable levels of nitrogen emissions to the environment are based on a publication of the EU Nitrogen Expert Panel[45], the proposition of the Commission of Agriculture at the German Environment Agency for Improving the CAP[46] (proposing a maximum surplus of 50 kg N/ha/a as precondition for receiving EU-subsidies) and the publication on the German nutrient balance regulation (cited above). *The application limit* Nitrogen from manure cannot taken up by plants when applied in very large amounts. Starting from an application rate of 120 kg N/ha the efficiency of the nitrogen use decreases over proportionally and the risk of leaching

[24] EU Nitrogen Expert Panel (2016) Nitrogen Use Efficiency (NUE) – Guidance document

for assessing NUE at farm level. Wageningen University, Alterra, PO Box 47, NL-6700 Wageningen, Netherlands. http://www.eunep.com/wp-content/uploads/2019/09/NUE-Guidance-Document.pdf

[25] The reason for that is that the production of feed requires additional or virgin N in form of fertilizer (or more rarely as biological fixation).

[45] EU Nitrogen Expert Panel (2015) Nitrogen Use Efficiency (NUE) - an indicator for the utilization of nitrogen in agriculture and food systems. Wageningen University, Alterra, PO Box 47, NL-6700 Wageningen, Netherlands

[46] Kommission Landwirtschaft am Umweltbundesamt, UBA (2013): Die Legislativ-Vorschläge zur GAP-Reform – gute Ansätze, aber für die Umwelt nicht gut genug (https://www.umweltbundesamt.de/publikationen/legislativ-vorschlaege-zur-gap-reform)

e) *If the farm has insufficient used agricultural area (UAA)* If a livestock farm imports feed, to either completely or partly feed its animals and requires therefore additional cropping area for manure application, it must prove that the cropping farm imports its manure and applies it according to the rules defined in these criteria. This applies also when the farm exports manure in form of digestates. Ideally this is done in such a way that the importing farm also makes a farm gate nitrogen balance which amends the balance of the exporting farm and which are submitted together. *f) If data is not available for three consecutive years* Then the agricultural holding can also rely on surplus calculations of the last two years, or if not available over the last year. This criterion is only	increases [47]. The German Environment Agency proposes therefore a manure application limit of 120 kg N/ha/ from cropland and of 140 kg N/ha/a for grassland[48]. Also, the EU-Commission states that "The definition of fertilizer application standards that ensures balanced fertilisation remains one of the most important and challenging measures"[49]. *Digital tools to record balances* On national or regional level many digital tools exist which either can already estimate farm gate nitrogen surpluses or collect the necessary data in order to do so with small changes to the software. These are for example the cool farm tool[50], Ferticalc[51],

[47] Gutser, R; Ebertseder, T; Schraml, M; von Tucher, S; Schmidhalter, U (2010): Stickstoffeffiziente und umweltschonende organische Düngung. In: KTBL-Schrift 483. KTBL-/vTI-Tagung 8-10. Dezember 2010. Emissionen landwirtschaftlich genutzter Böden. Darmstadt, S 31–50

[48] Umweltbundesamt 2021, Perspektiven für eine umweltverträgliche Nutztierhaltung in Deutschland, UBA-TEXTE 33/2021

[49] REPORT FROM THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT on the implementation of Council Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources based on Member State reports for the period 2012–2015

[50] https://coolfarmtool.org/

[51] http://www.uco.es/fitotecnia/fertilicalc.html.

valid for the farm at the beginning of the accounting period. *g) If no digital tool is available to the holding* The surplus must be estimated according to the rules set up by the EU Nitrogen Expert Panel in their guidance document for farms[26]. The farmer must follow the Tier-Approaches described in the document, meaning that more precise estimations of input or output factors must be used preferable to less precise estimations. For all elements in the table that are marked "net", imports and exports must be accounted for and the sum (negative or positive) must be integrated into the balance.	AGROasesor[52], AZOFERT[53], Landsupport project h2020 Dynamic Armosa[54], (PIANO DI CONCIMAZIONE AZIENDALE - ON-FARM FERTILIZATION PLAN) Regione Campania (Italy)[55] or the tool N-Expert[56]. In the original proposal[57] of the EU-COM for the new CAP, the EU-COM proposed that "*Member States shall establish a system for providing the Farm Sustainability Tool for Nutrients […] to beneficiaries, who shall use the Tool*." Although it is not part of the current proposal, the FaST tool[58] is still under development in DG Agri and is used by regions in Spain and Italy, as well as Estonia[59]. Although the primary purpose of the tool is to support fertilizer planning, it can easily be adopted to the

[26] EU Nitrogen Expert Panel (2016) Nitrogen Use Efficiency (NUE) – Guidance document for assessing NUE at farm level. Wageningen University, Alterra, PO Box 47, NL-6700 Wageningen, Netherlands, http://www.eunep.com/wp-content/uploads/2019/09/NUE-Guidance-Document.pdf

[52] https://www.agrogestor.es/plataformas/plataforma-agroasesor/

[53] http://www.rmt-fertilisationetenvironnement.org/moodle/course/view.php?id=6

[54] https://www.landsupport.eu

[55] http://www.agricoltura.regione.campania.it/concimazione/PRCFA_intro.html

[56] https://www.igzev.de/projekt_type/n-expert-duengung-im-freilandgemuesebau/?lang=en

[57] Regulation on the new CAP post-2020 COM(2018) 392 Recital 22, Article 12.3 and ANNEX III

[58] https://ec.europa.eu/info/news/new-tool-increase-sustainable-use-nutrients-across-eu-2019-feb-19_en

[59] https://fastplatform.eu/about

	purpose of generating farm gate nitrogen balance. *A farm-gate balance module could be integrated into the FaST as a quick and easy digital tool*.[60] We therefore recommend that the EU-Commission promotes and develops FaST as a global tool for farmers to obtain their nitrogen balances.

Table 4: Criteria that apply to options A, B *and* C (unless otherwise stated)

Criteria	Rationale
1. Minimising habitat loss or conversion^	
1.1. The activity has not led to the conversion or fragmentation of high-nature-value land, forests, or other lands of high-biodiversity value excluding wetlands[61] since 2008, or at any future date.	
1.2. The activity has not led to the draining, infilling, or other physical damage to wetlands and aquatic habitats as defined under The Ramsar Convention on Wetlands, encompassing peatlands,	Drained agricultural land is one of the largest sources of GHG-emissions, but drainage also reduces on farm biodiversity (e.g., loss of waders' habitat) and leads to

[60] Policy recommendations from the EU-project SuMaNu - Sustainable Manure and Nutrient Management for reduction of nutrient loss in the Baltic Sea Region (*https://balticsumanu.eu/userassets/uploads/2021/04/Sumanu_policy-recommendation-2_FINAL.pdf*)

[61] Lands of high-biodiversity-value are specified in Article 29(3) Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources (OJ L 328, 21.12.2018, p. 82).

floodplains, riparian zones (see below), aquatic (rivers, ponds, springs, etc) and coastal habitats, since 2008 or at any future date. N.B. It is noted that paludiculture activities (including grazing of buffalo) is permissible, where evidence is provided that production has not and will not involve drainage of previously undrained soil.)	degradation of adjacent natural habitats such as wetlands and forest.
1.3. The activity will not lead to any further drainage of moist farm areas, such as springs, flushes, water meadows, etc.	
1.4. For holdings located in or near to biodiversity-sensitive areas (including the Natura 2000 network of protected areas, UNESCO World Heritage sites and Key Biodiversity Areas ('KBAs'), as well as national protected areas): a. Through either conversion or subsequent production since 2008 or going forward, activities do not lead /have not led to the deterioration of natural habitats and the habitats of species and to disturbance of the species for which the protected area have been designated b. Land conversion and production activities are carried out in accordance with the conclusions of	

an appropriate assessment[62], where applicable, and necessary mitigation measures[63] have been implemented accordingly[64]	
1.5 Natural grasslands[65] or other natural habitats are not subject to new or increased livestock grazing pressure or in any other way degraded (e.g., converted, intensified, fertilised, re-seeded, ploughed). The sole exception to this is if it is conservation grazing required for the maintenance of the natural habitat or improves biodiversity and avoids overgrazing.	
1.6 Semi natural grasslands[66] of high biodiversity are not modified through ploughing, seeding, fertilisers, chemicals, mulching etc or converted to	

[62] In accordance with Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (OJ L 20, 26.1.2010, p. 7) and Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (OJ L 206, 22.7.1992, p. 7), or, for activities located in third countries, in accordance with equivalent national provisions or international standards, for example International Finance Corporation (IFC) Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources.

[63] Those measures have been identified to ensure that the project/plan/activity will not have any significant effects on the conservation objectives of the protected area.

[64] Consistent with Statutory Management Requirements 2 and 3 of Regulation (EU) No 1306/2013 and in particular Article 6, paragraphs 1 and 2, of Directive 92/43/EEC and Article 3(1), Article 3(2), point (b), and Article 4, paragraphs 1, 2 and 4 of Directive 2009/147/EC.

[65] For grassland definitions, see Table 1.

[66] For grassland definitions, see Table 1.

other land-use including to build grey infrastructure unless convincing conservation rationale, for example floristic enrichment of impoverished grasslands by the spreading of seeds harvested from biodiverse grasslands	
2. Creation and maintenance of High Biodiversity Landscape Features (HBLFs)^ *Applicable for Options B and C only*	
2.1. Non-productive high biodiversity landscape features are maintained on at least 10% of the farm area. Specifically: • If the current % is below 10%, then 10% non-productive HBLF is reached within a year. • If the current % is above 10%, then this % is maintained. I.e., Existing HBLFs are not destroyed or converted. **2.2. Management of non-productive HBLFs**	The inclusion of criteria relating to the creation or enhancement of high-biodiversity landscape features is deemed important as agriculture covers c39% of land area in the EU.[67] The EU Biodiversity Strategy requires at least 10% of agricultural area in the EU to be under high-biodiversity landscape features.[68] Many studies converge on 10-14% HBLFs at farm scale as a minimum to avoid crossing critical thresholds of biodiversity loss (Opperman, 2008; Pe'er et

[67] doi: 10.2785/340432, global: Land Use - Our World in Data based on FAOSTAT 2019

[68] "To provide space for wild animals, plants, pollinators and natural pest regulators, there is an urgent need to bring back at least 10% of agricultural area under high-diversity landscape features. These include, inter alia, buffer strips, rotational or non-rotational fallow land, hedges, non-productive trees, terrace walls, and ponds." Target of the Biodiversity Strategy to 2030.

2.3.1. No use of fertiliser, plant protection products or other chemicals within 10m of HBLFs **2.3.2. No vegetation cutting / grazing / mowing of non-productive HBLFs during sensitive times of year** such as bird breeding and plant flowering & seed development **2.3.3. No increases in drainage efficiency** such as replacement of drainage ditches with underground pipes. **2.3.4. Invasive alien species are removed to the extent possible without recourse to chemicals** *Methodological notes:* *Non-productive HBLFs are features primarily for habitat and biodiversity, usually but not always native vegetation based. If a yield is taken, it is incidental and a by-product to the management of the habitat (e.g., hay cut from fallows). Specifically:*	al 2020; Biogea, 2020), such as: birds (Traba & Morales, 2019; Walker et al, 2018; Mechtry-Stier et al, 2014 – includes hares; Aebischer & Ewald, 2004), and pollinating and other insects (Humbert et al, 2010; Pfister et al, 2020). Further, inclusion of HBLFs can increase crop yields (Dainese et al 2019 – a global review). Pywell, 2015 shows even modest measures of habitat provision at field edge can increase crop yields (e.g., through buffering field edge conditions) and pay for themselves within a single crop rotation cycle (Pywell, 2015). The share of fallow land in UAA in the EU27 is 4.1% (Eurostat, x), estimated UAA covered by landscape features (Grass margins, shrub margins, single trees bushes, lines of trees, hedges and ditches) (based on LUCAS survey 2015) is 0.5%. This estimation is to be taken with caution because of methodological caveats. The HBLFs are spatial features but their integrity depends also on management to be made clear in the Farm Management Plan, e.g., from the CAP: GAEC 9 – a ban on cutting hedges and trees during the bird breeding and nesting season, and as an option, measures for avoiding invasive plant

• *Native vegetation non-productive HBLF: riparian vegetation, native trees (scattered or in groups), non-crop areas within the farm such as buffer strips, field margins with wildflowers or grass, rotational or non-rotational fallow land, hedges, riparian vegetation.* • *Other non-productive HBLF: non-productive trees, terrace walls, stone walls, and ponds.* *The baseline types, extent and condition of the occurring HBLF must be identified in the Biodiversity and Ecosystems impact assessment and surveyed, registered and monitored.* *The HBLF types and locations must be in line with local protection objectives if such exist. The Farm Sustainability Management Plan (FSMP) must explain how national and local priority species and habitats, present or potentially present in the farm, are being supported by the HBLF.* *The FSMP must describe how HBLFs will be created and managed in line with these criteria.*	species [anything else to add to avoid damage to nesting birds and mammals during key times of the year e.g., field margins & within crop vegetation controls. Both natural and semi-natural habitats are based on communities of native plant species. Their species diversity is often reduced as levels of nutrient deposition increases. This separates, for instance, extensive semi-natural pasture from 'improved pasture'. To retain natural/semi-natural characteristics, these areas should not be fertilised, nor their biota impacted by pesticides, nor their life-cycles impeded by inappropriate management of vegetation in breeding/flowering/seeding times, nor abiotic factors such as hydrological regime altered. Where invasive and non-native species have encroached, to the extent feasible they should be reduced.

2.2. Water courses and bodies have buffer-zones sufficient for conservation of riparian community & prevention of leaching into watercourses. Specifically riparian zones: • Are of native vegetation natural to habitat, managed for biodiversity • Are continuous along water bodies • Cover all stream orders, including ephemeral streams and first order streams. • Have no application of fertilizer and plant protection products in a 10 m vicinity beside surface water bodies[88] • Are at least: • For ditches: buffers = 5m wide • For small / medium rivers and standing water bodies (up to 15m wide): buffers = 10m • For large water bodies, above 15m wide: buffers = 30m The FSMP must describe how HBLFs will be created and managed in line with these criteria.	Riparian buffer zones provide crucial ecosystem services (Riis *et al. (2020).* Global Overview of Ecosystem Services Provided by Riparian Vegetation. Bioscience**.** Small water bodies are vulnerable to changes that have little effect on larger water bodies. For example, they can be affected by small point sources like spray drift of pesticides. Small water bodies are affected by local land management and local scale changes in hydrology. They are also likely to be exceptionally vulnerable to climate change impacts. Small ponds have only a limited ability to dilute and retain pollution, and therefore they are highly susceptible to inputs of even small amounts of pollutants from their surroundings, such as nutrients from agriculture (Kristensen,P. and Globevnik,L. 2014. European small water bodies. Biology and Environment: Proceedings of the Royal Irish Academy 2014. DOI:10.3318/BIOE.2014.13) **Ditches:** Farm drainage ditches are, analogous to hedges, important for

	biodiversity connectivity in agricultural landscapes (see Herzon 2008). **5 m** (because we cannot expect 10m on ditches) 5m is the minimum for 'bank stabilisation' in Hawes & Smith, 2005. **6m –** Natural England (2011), recommendation for ditches A 5m grass buffer reduced phosphorous very effectively but 60-90% effective for herbicides. Therefore, can stipulate 5m, but preferably not grass (i.e., woody). **Rivers, streams, ponds & lakes etc less than 15m wide** **10 m** (Brazil Forest Code 2012) Yale (Hawes & Smith, 2005): "For low to moderate slopes, most filtering occurs within the first 10 m, but greater widths are necessary for steeper slopes, buffers comprised of mainly shrubs and trees, where soils have low permeability, or where NPS loads are particularly high." Danish law: Mandatory buffer zones up to 10 meters along all open streams and lakes larger than 100 m2 10m is not excessive, perhaps not enough:

	The widths of **12 m had an inadequate protection** for the concentration of nutrients use-d in the study sites (Aguiar, 2015) **15m + water bodies:** Brazil Forest Code 2012 – min. 30m, max 100m – buffer to be half the width of the water body Yale (Hawes & Smith, 2005) (p.8): For water bodies where surrounding land is more than 15%, **32.5m.** Also**,** 3 Zone system (p.9) = **35m** (bank stabilisation (5m), Trees and shrubs 20m, Grasses & Herbs (10m)). Aguiar (2015): The higher efficiency of **woody vegetation zones** of **36 m** and 60 m widths, combined with agricultural economy, presents a greater potential for acceptance by rural producers, thereby facilitating the diffusion of this conservation practice in agriculture. Furthermore, the width of **36 m** was appropriate to reduce the nitrate concentration to levels below the required values (levels) defined in the water protection legislation and regulatory standards.
3. Grazing regime^	

3.1 Grazing intensity[69] **3.1.1 Grazing intensity is planned, records kept, and is within biodiverse carrying capacities specific to habitat and in accordance with supplementary feed rules** (see section 5 below) **3.1.2 Grazing intensity of natural and seminatural grasslands (and of habitats qualifying under option A) is never above 0.7 LU per ha. For other grazing land (e.g., improved pasture) the limit is 1.5 LU/ha** (unless local biodiversity authorities stipulate as appropriate for the local habitat, and less if required for specific habitats) and leads to/ensures the maintenance of good status of the semi-natural habitats (e.g., as defined in the EU Habitat Directives)	These criteria aim to ensure grazing activity is not exceeding the natural ecological carrying capacity taking into account the needs of natural grazing animals. Preservation of biodiversity requires stocking densities that are significantly lower than what is considered an agronomical optimum. This is necessary to ensure a sustainable utilization of the pasture by limiting losses of biodiversity associated with repeated trampling and refusals[70] as well as nutrient loss.
3.2 Grazing methods: Biodiversity favourable grazing methods deployed (be it continual, rotational, or mob grazing) within sustainable intensity.	

[69] 14882.pdf (europa.eu)

[70] manual_for_min_standards_low_resoultion_may_2012.pdf (iucn.org) Grassland of the world (fao.org)

3.3 Grazing timing: Adhere to local habitat requirements for maintaining biodiversity qualities of site (allowing sward herbage to flower and seed, invertebrate life-cycles, bird-nesting periods, etc).	
3.4 Other disturbance: Non-grazing methods of maintaining sward, such as fire and mechanical control, are also planned, setting out type, timings, intensities, and locations, observing the following: o **No ploughing** unless a convincing conservation rationale is contained in an official conservation plan – e.g., mimicking natural disturbance livestock cannot fulfil – such as wild boar foraging, etc o **No use of fire** unless in fire adapted biomes where beneficial impact on biodiversity can be proved. Prescribed burns must be managed to ensure complete protection of on farm and off farm natural habitats.	
4. No direct harm to wildlife^	
4.1. No intentional capture or killing of vertebrate wild animals other than:	

• For legally permitted subsistence or recreational hunting (adhering to all laws on target species, methods, season, quota, etc) • Indoor pest control – with measures to prevent affecting non-target animals. Only EU permitted chemicals permissible (see Section 7 chemicals below) • Control of invasive alien species or species control as part of a biodiversity conservation plan sanctioned by a competent national authority.	Vertebrates as invertebrates dealt with in rules on pesticides.
4.2. No intentional killing of species (any taxa) classified by national or international IUCN red lists as 'near threatened' or more severe categories (e.g., vulnerable, endangered, critically endangered, etc).	
4.3. No use of unselective methods as per EU Habitat Directive Annex 6	
4.4. Limiting barriers to wildlife movement • Fencing & other barriers (permanent & temporary) should not interrupt movement capabilities	

of wild animal populations, especially migratory species. • Wildlife connectivity needs to be identified and sufficient measures taken to enable movement (e.g., design of or gaps in fencing, tunnels, bridges, etc). • Fencing can be used to protect from wild predators, in accordance with the above	
4.4 Use of non-native species **4.4.1 Alien species that are considered invasive or high risk are not cultivated** (in Europe, this applies to species of Union concern or on Member States' national lists. Outside Europe, national lists of competent bodies). **4.4.2. Alien species not included in the above-mentioned lists are cultivated only where there is negligible risk of invasion, following a risk assessment process.** Precautionary principle employed to prevent spread of non-native species. **4.4.3. In case of detection of invasive alien species in the farm area**, the necessary measures are taken based on available scientific evidence, and	Vertebrates as invertebrates dealt with in rules on pesticides. The cultivation of alien species complies with the applicable rules regarding the risk, monitoring and safeguards – in Europe, in accordance with Regulation (EU) No 1143/2014 on invasive alien species, of the European Parliament. "Invasive alien species generally cause damage to ecosystems and reduce the resilience of those ecosystems. Therefore, proportionate restoration measures should be undertaken to strengthen the ecosystems' resilience towards invasions" REGULATION (EU) No 1143/2014 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the prevention and

guidance of competent authorities, and principle that early detection and rapid eradication measures are crucial to prevent the spread of IAS. If eradication is not feasible, containment and control measures should be applied. Management measures should avoid any adverse impact on the environment. *Methodological notes:* *'Invasive alien species' means an alien species whose introduction or spread has been found to threaten or adversely impact upon biodiversity and related ecosystem services.* *'Early detection' means the confirmation of the presence of a specimen or specimens of an invasive alien species in the environment before it has become widely spread.* *'Eradication' means the complete and permanent removal of a population of invasive alien species by lethal or nonlethal means.* *'Containment' means any action aimed at creating barriers which minimises the risk of a population of an invasive alien species dispersing and spreading beyond the invaded area.*	management of the introduction and spread of invasive alien species.

5. Supplementary feed^	
5.1. Limitations on supplementary feed: **All livestock** • When purchasing feeds with large potential upstream impacts, including indirect land use change, for instance soya and palm oil-based feeds, selected feeds demonstrably comply with Table 4, Section 1, being certified by a recognised body as not from areas recently converted from natural habitats (from whichever is the earliest date, 2008 or that in the certification). • No feed containing fish - except for waste materials such as skins, blood, bones etc. Bycatch is not included in this definition of waste. **For grazers (ruminants and herbivorous monogastrics)** Unless extreme circumstances necessitate time-limited emergency measures (e.g., due to local drought): • Majority of annual feed requirement is grazed from grasslands either on-site or as brought-in hay - at least **75%**	Ecosystems, both on-farm and beyond, are seriously impacted by feed strategies. These measures promote livestock operations fed primarily through on farm or circular economy resources, reducing the use of human foodstuffs as feed. The criteria are slightly different for grazing animals and monogastrics. Grazers (I.e., ruminants - cows, sheep, goats; and herbivorous monogastrics - horses, rabbits, etc) should graze their natural diet as much as possible, to reduce the ecological footprint of feeding them on cereals and favour their role as grassland managers (grass-fed livestock also have healthier fat profiles). Omnivorous monogastrics (pigs, poultry, etc) have potential to eat a wider variety of waste products from farming and wider society (as they were originally bred to do). The scale of the potential for utilising circular economy solutions is hinted at by the fact, globally, a third of human food is wasted[45] – and this is only one circular economy stream that could be deployed with livestock.

• At least half the remaining supplementary feed **(12.5%)** comes from agroecology outputs (e.g., catch crops, cover crops, cut tree forage) or circular economy outputs. **For non-herbivores (e.g., poultry, pigs, etc)** □ At least 75% of annual feed requirement comes from within the holding, agroecological outputs (e.g., catch crops, cover crops, cut tree forage) or circular economy outputs	Ideally, it would be preferable to require that feed production complies with the full set of crop production criteria. However, this may not be practicable at this point in time due to limited traceability over supply chains. Therefore, a simplified set of criteria are applied here. **Land-use change** The biggest pressure on global biodiversity is change in land and sea use[71] causing loss and degradation of habitat. This continues – in the tropics, most new agricultural lands are at the expense of forests[72]. It is essential to avoid the growing of feed on new agricultural land replacing biodiverse and climate regulating habitats - such as when tropical forests are cleared for soy production for soy cake[41] This is addressed through safeguards on importing feeds and encouraging on-site and circular economy feed sources.

[71] IPBES (2019), Global assessment report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, p.xvi

[72] Gibbs et al (2010), cited by IPBES 2019, GLOBAL ASSESSMENT REPORT ON BIODIVERSITY AND ECOSYSTEM SERVICES. CHAPTER 2.1 STATUS AND TRENDS – DRIVERS OF CHANGE. p.109. (Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)).

	Excessive ecological footprint of feed crops One third of global cereal production is currently fed to livestock[42]. Much of this is protein rich food that could more efficiently (by one or two orders of magnitude - i.e., with ten to a hundred times less land take) be used to feed people[73]. This excessive ecological footprint is addressed through limitations on the amount and origin of supplementary feed. Inefficient ecological footprint increases the land under agricultural coverage, reducing bioproductive land space available to forests, nature reserves, etc. **Marine biodiversity** Marine biodiversity (and productivity) is also seriously impacted by making feed from ocean-caught fish. In 2009, 36% of the world fishery annual catch was used to make fishmeal and oil to feed farmed fish, chickens and pigs[43]. This issue is addressed through only permitting genuine fishery wastes for livestock feed.

[73] Krausmann et al (2008). Global patterns of socioeconomic biomass flows in the year 2000: A comprehensive assessment of supply, consumption and constraints. Ecological Economics

	On farm biodiversity Importing feedstuffs from far beyond farm boundaries was not possible prior to modern agriculture and fossil-fuel transport systems. As well as the greenhouse gas emissions from transporting feed around the world, doing so reduces the likelihood of mixed farms and crop rotations – both important for on-farm biodiversity. For activities where grazing is good for biodiversity (per the criteria above), most of the feed will come from on-site grazing, and these criteria are a check that this is the case. The % should enable systems like good practice pampas, where an improved field may be kept for fattening or using during drought. In more intensive farms, these criteria ensure grazers mainly eat their natural diet, not human foods, and thus also contribute to grassland management. It is also desirable to address the direct impacts from the use of supplementary, imported feed to avoid nutrient enrichment in the location where the feed is being used. The criteria here are aligned with the nutrient balance (see Option 3).

APPENDIX A: Additional criteria for DNSH to Pollution Prevention and Control

For livestock farming, there are a range of possible management measures to reduce nitrogen exposition in different forms. Three measures have been selected which are effective and relatively easy to implement and should therefore be affordable to all farms. The measures are described in:

- the *Guidance document on integrated sustainable nitrogen management* which has been originally developed by the Task Force on Reactive Nitrogen (TFRN) under the Working Group on Strategies and Review of the UNECE Convention on Long-range Transboundary Air Pollution[74] and is now adopted by the UNECE Executive Body for the Convention on Long-range Transboundary Air Pollution[75],
- the HELCOM[76] document *Revised Palette of measures for reducing phosphorus and nitrogen losses from agriculture*[77],
- Best Available Techniques (BAT) Reference Document for the Intensive Rearing of Poultry or Pigs[78].

Criteria	**Rationale**

[74] http://www.clrtap-tfrn.org/

[75] United Nations, Economic and Social Council, Executive Body for the Convention on Long-range Transboundary Air Pollution (2021): *Guidance document on integrated sustainable nitrogen management,* https://unece.org/environment/documents/2021/04/working-documents/guidance-document-integrated-sustainable-nitrogen

[76] HELCOM is the governing body of the "Convention on the Protection of the Marine Environment of the Baltic Sea Area", https://helcom.fi

[77] Baltic Marine Environment Protection Commission (2013): Revised Palette of measures

for reducing phosphorus and nitrogen losses from agriculture, https://helcom.fi/media/documents/Revised-palette-of-agri-environment-measures.pdf

[78] JRC (2017): Best Available Techniques (BAT) Reference Document for the Intensive Rearing of Poultry or Pigs https://eippcb.jrc.ec.europa.eu/reference/intensive-rearing-poultry-or-pigs-0

1.2.1 The farm holding has a feeding plan for all livestock on the farm. The feeding regime is adjusted to animal performance, unnecessary P and N-surpluses are avoided, and multi-phase feeding is implemented. The feeding plan includes information on: • The number and kind of animals (including rearing phase) • Number of meals provided • Nutritional contents of the meals provided • Changes of feeding content over the live span of the animal The following feeding strategies are implemented and described accordingly in the feeding plan: 1. The adaptation of crude protein and ruminal N balance for cattle 2. The adaptation of feeding to the status of the development and the level of productivity of animals (e.g., milk yield for dairy cattle, daily weight gains for beef and fattening pigs). The nutrient content is chosen according to country- and animal specific nutrient requirements, if such exist.	The crude protein content and composition of the animal diet is the main driver of nitrogen excretion. Excess crude protein (CP) that is not needed by the animal is excreted and can easily be lost in the manure management chain. Adaptation of crude protein in the diet to the nutrient requirements of the animal is therefore the first and most efficient measure to mitigate nitrogen emissions. This measure reduces the loss of all N forms because it reduces the amount of excreted nitrogen[80].

[80] United Nations, Economic and Social Council, Executive Body for the Convention on Long-range Transboundary Air Pollution (2021): *Guidance document on integrated sustainable nitrogen management,* https://unece.org/environment/documents/2021/04/working-documents/guidance-document-integrated-sustainable-nitrogen

For example (more detailed description can be found in the referenced documents): • Dairy cattle: phase feeding during lactation and between lactation periods • beef cattle: phase feeding during fattening (at least beginning, middle, end) • Sows: phase feeding for mating/ gestating and farrowing sows • Fattening pigs: multi-phase feeding (at least beginning, middle, end) • broilers, turkeys, ducks: multi-phase feeding (beginning, middle, end) 3. The use of free amino acids for pigs and poultry (as far as possible - not applicable for organic farms[79]) 4. The adaptation of the feed content to the level of the productivity of animals (e.g., milk yield for dairy cattle, daily weight gain for beef and fattening pigs). The feed content must be chosen according to country-specific feeding requirements if such exist.	
1.2.2. Slurry tank and manure stores are covered[81]	Significant N losses may occur during storage of manures (slurries, farmyard

[79] According to most national organic and the international IFOAM standards, https://ifoam.bio/sites/default/files/2020-09/IFOAM%20Norms%20July%202014%20Edits%202019.pdf p.16

[81] A wide range of options are available such as: solid lids, plastic sheeting as well as a natural crust. These must be selected according to manure type. A precise description of possible covers can be found under manure

	manures, solid manures, chicken dropping). These losses (especially ammonia) can be reduced when covering storage facilities.
1.2.3. Solid manure outside the barn is stored on paved ground in a dry/covered location. This storage should not be on a slope, should be in sufficient distance from water bodies and should have some form of bunding to prevent accidental runoff. For eventually occurring liquids a drainage system should be established.	To avoid N-leakage
1.2.4. There is sufficient storage capacity for manure to ensure that no manure is applied outside the appropriate application times. **1.2.5. The farm provides sufficient storage capacity for slurry** to ensure no slurry is applied at times other than the appropriate application periods defined.	Adequate collection and storage facilities provide the possibility to apply manures at the "right time", when the plant stocks are in highest need of nutrients choose when to apply manure to fields. With sufficient capacity of storage there will be few occasions when lack of capacity forces the farmer to spread manure at unsuitable times[82].

measure 1-3 in the UNECE Guidance document on integrated sustainable nitrogen management https://unece.org/sites/default/files/2021-04/Advance%20version_ECE_EB.AIR_149.pdf

[82] Baltic Marine Environment Protection Commission (2013): Revised Palette of measuresfor reducing phosphorus and nitrogen losses from agriculture, https://helcom.fi/media/documents/Revised-palette-of-agri-environment-measures.pdf

1.2 Crop production

Description of the activity

These criteria cover the growing of crops in open fields. At this time, they do not cover growing of crops in greenhouses or other indoor settings.

In accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006, these activities are classified under the following NACE codes:

NACE codes 1.1 and 1.2:

1.1 Growing of non-perennial crops:

01.11 - cereals (except rice), leguminous crops and oil seeds;

01.12 – rice;

01.13 - vegetables and melons, roots and tubers;

01.14 - sugar cane;

01.15 – tobacco;

01.16 - fibre crops;

01.19 - other non-perennial crops

01.28 - spices, aromatic, drug and pharmaceutical crops;

1.2 Growing of perennial crops:

01.21 - grapes;

01.22 - tropical and subtropical fruits;

01.23 - citrus fruits;

01.24 - pome fruits and stone fruits;

01.25 - other tree and bush fruits and nuts;

01.26 - oleaginous fruits;

01.27 - beverage crops;

01.28 - spices, aromatic, drug and pharmaceutical crops;

01.29 - other perennial crops

And:

01.50 – mixed farming (Also covered under 'Animal Production' as explained in Rationale.)

These criteria are applicable to crop production activities with integrated conservation and restoration as captured in the criteria below. A crop producer can alternatively use the criteria under 'Conservation of Habitats and Ecosystems' and / or 'Restoration of Habitats and Ecosystems' to assess conservation or restoration activity that can be separately distinguished from any crop production activity.

Substantial contribution to transition to the protection and restoration of biodiversity & ecosystems

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The Criteria: Three ways have been identified in which the activity of crop production can make a substantial contribution to the protection and restoration of biodiversity and ecosystems (hereafter 'SC to B&E'). These are:

When the farm area incorporates large areas that are biodiversity rich AND ensures alignment in respect of a number of aspects common to Options A, B and C

When it ensures a sustainable farm gate nitrogen balance AND ensures alignment in respect of a number of aspects common to Options A, B and C

When it completely abstains from the use of synthetic plant protection products and copper that harm biodiversity and ecosystems AND ensures alignment in respect of a number of aspects common to Options A, B and C.

The activity would need to satisfy only *one* of these options to be deemed to be making a SC to B&E, although of course it may satisfy more than one.

Tables 1, 2 and 3 describe criteria relating specifically to Options A, B and C respectively. Table 4 describes criteria which apply to Options A, B *and* C (unless explicitly noted otherwise). That is:

To meet Option A, the activity must satisfy **all** criteria described in Table 1 AND Table 4.

To meet Option B, the activity must satisfy **all** criteria described in Table 2 AND Table 4.

To meet Option C, the activity must comply with **all** criteria described in Table 3 AND Table 4.

Demonstrating compliance via a Farm Sustainability Management Plan (FSMP): A spatial and temporal FSMP sets out the agricultural holding's strategy to meet these Criteria, and acts as the documentation to evidence compliance. The FSMP:

Describes the holding's biophysical environment and cropping system, including information on land use change;

Identifies the management practices or other measures that ensure compliance with the criteria described below. The FSMP incorporates and is informed by any assessments required to enable and/ or demonstrate compliance with any part of these criteria. At a minimum this includes a Biodiversity & Ecosystem Impact Assessment that identifies and prioritises the activity's contributions (historical and potential) to local/national habitat and species conservation priorities (based on the land, water and other assets of the activity).

Record keeping: The agricultural holding keeps a yearly record of its performance, including information on the deployment of management practices to meet the criteria.

Verification: The information in the yearly records and the Farm Sustainability Plan is verified to be complete, correct and of high quality. That verification is carried out by an independent third-party body at the request of the agricultural holding at the beginning of the investment period and every three years thereafter.

Please note: criteria to identify when particular investments within the economic activity might be recognised as making a substantial contribution, even where the activity as a whole does not (yet) meet the activity-level criteria presented here, remain under discussion.

Do no significant harm ('DNSH')

(1) Climate change Mitigation	1. Permanent grassland is maintained. 2. Wetland and peatland are appropriately protected.

	3. Arable stubble is not burnt, except where an exemption has been granted for plant health reasons. 4. Minimum land management under tillage, including on slopes. 5. Continuously forested areas, namely land spanning more than one hectare with trees higher than five meter and a canopy cover of at least 10% or able to reach those thresholds in situ[83], are not converted No use of peat or peat containing product or material e.g., as growing medium, fertilizer etc. The Farm Sustainability Management Plan identifies the management practices or other measures that ensure compliance with these criteria.
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.
(3) Sustainable use and protection of water and marine resources	DNSH as set out in Appending B of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852. AND 1. Where the activity involves water abstraction, a permit for water abstraction, where such is required, has been granted by the relevant authority for the activity, specifying conditions to avoid significant impact on water bodies. 2. If the holding is located in a WEI+ river basin area 20% or above (or equivalent), the activity's water use does not increase net catchment water exploitation compared to a baseline of

[83] In accordance with Article 29, paragraphs 4 and 5 of Directive (EU) 2018/2001. This requirement applies to all perennial crop production, whether for biofuels, bioliquids or biomass, or for food or feed uses.

	immediately prior to the activity's commencement/cut-off date investment period. 3. If the holding is located in a water stress area (defined as where: (1) the mineralization of the groundwater is already relatively high or increasing, and the extraction of additional water may have additional negative effect; and/or (2) the water resources of the area concerned have already been under stress and under monitoring for several years, with a volume of use greater than the natural recharge of the spring reserves), no other water abstraction than only water harvesting is considered. 4. When using an irrigation system: (1) input water source comes from the same river basin; (2) sources as rainwater harvesting systems and/or reclaimed water from an urban or industrial WWP that complies the EU Regulation on minimum requirements for water reuse for agriculture irrigation are prioritised; (3) The input water is metered and registered; (4) The irrigation system is highly efficient at farm level: system efficiency should be at least 60% for furrow irrigation, 75% for sprinkler and 90% for drip irrigation. 5. No modification of water bodies, e.g., straitening of rivers, lining ditches, removal of riparian vegetation, etc. The Farm Sustainability Management Plan identifies the management practices or other measures that ensure compliance with these criteria.
(6) transition to a circular economy	1. Non-natural waste materials generated in the course of growing of crops, including used protected cultivation films, unused agrochemicals or fertilisers, packaging or net wraps are collected by certified waste management operator and recycled or disposed, if hazardous or otherwise not recyclable. 2. Natural (organic) material is not burned without energy recovery nor left to rot.

	The Farm Sustainability Management Plan identifies the management practices or other measures that ensure compliance with these criteria.
(5) Pollution prevention and control	All criteria in the ***Supplementary Material*** of this document AND The Farm Sustainability Management Plan identifies the management practices or other measures that ensure compliance with these criteria. Measures are taken to ensure that, for each agricultural holding, the amount of livestock manure applied to the land each year, including by the animals themselves, does not exceed 170 kg N ha-1 per hectare or different amounts in accordance with the conditions set out in Annex II to Council Directive 91/676/EEC[84]. Only plant protection products with active substances that ensure high protection of human and animal health and the environment are used. This means only the use of plant protection products that are authorized under the EU Pesticides database[i]. Outside EU the principle of the Integrated plant production Directive 2009/128/EC (sustainable use of pesticides) is followed and more particularly concerning sufficient knowledge regarding the subjects listed in Annex I, the Health and safety and environmental requirements relating to the inspection of pesticide application equipment in Annex II as well as the General principles of integrated pest management Annex III. The Farm Sustainability Management Plan identifies the management practices or other measures that ensure compliance with these criteria.
Rationale	

[84] Council Directive 91/676/EEC of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources (OJ L 375, 31.12.1991, p. 1).

The scope of activities selected

The production of all crop types per the NACE codes listed above are addressed here under one set of criteria for 'crop production' as there are significant commonalities in pressures to/ potential for improvements in biodiversity and ecosystems from the production of all of these crops, and hence significant commonality in the criteria required. More differentiation arises according to the nature of the production system than the crop type. Furthermore, classification is sometimes arbitrary and many rules apply to both systems. Where some distinction is needed, this is noted in the criteria tables.

Production in greenhouses and other indoor settings is not included in scope as in this phase of work priority was given to production in open fields because this represents a greater proportion of agricultural production and biodiversity impacts. Greenhouses and other indoor production systems would require a tailored set of criteria.

For the purpose of the Taxonomy, **mixed farming** involves any operation with both animal and crop production. Crops grown in mixed farming can be grown either to feed livestock or for separate sale as a cash crop. It is important to note that recoupling of crops and livestock can lead to greater resource efficiency and reduced reliance on synthetic inputs, thus improving climate and environmental performance[85]. At the same time, if accompanied by productivity improvement on existing agricultural lands, mixed farming reduces the expansion pressures of agriculture into non cultivated/used land. Therefore, recoupling of crop and livestock production can be beneficial and feasible in many contexts, but it is not a mandatory requirement of the Taxonomy.

However, mixed farming can be assessed under the Taxonomy. In assessing mixed farming operations, cropland production should be screened using criteria for growing of perennials (e.g., if vineyards or orchards are included) or non-perennial crops (e.g., if a farm grows cereals). Livestock production should be assessed according to the animal production criteria. I.e., the activity needs to meet the crop production criteria in respect of the crop production element, and the animal production criteria in respect of the animal production element.

Context: How crop production impacts biodiversity and ecosystems

[85] fg16_mixed_farming_final-report_2017_en.pdf (europa.eu)

The most significant impacts include:

Release of nutrients and chemical pesticides, pharmaceuticals and hazardous chemicals – including but not limited to nutrient depositions leading to eutrophication and soil acidification[86];

The clearing or fragmentation of natural or semi-natural vegetation due to land take for crop production, reducing habitats and biome connectivity[87];

The removal or mismanagement of biodiversity valuable landscape elements leading to the reduction of habitats and their connectivity

Loss and degradation of permanent grassland[88] due to land intensification (ploughing, re-seeding, fertilisation)

Water abstraction for irrigation as this leads to pressure on ecosystems in water scarce regions

The decline of genetic diversity in crops accelerating biodiversity loss.

The loss of insect biomass and diversity negatively affecting crop pollination[89]

Other farm management practices harming biodiversity – e.g., fencing disrupting wildlife movements, fire-stubble burning, soil degradation leading to loss of soil biodiversity.

A substantial contribution

All of the options laid down in the section **Technical Screening Criteria for substantial contribution** represent a substantial contribution to the protection and restoration of biodiversity and ecosystems as under these options the activity both:

[86] ETC/ICM Report 2/2016

[87] MEA 2005, EEA 2005. Noting that in the EU fragmentation is the bigger impact as there is little new land take for agriculture. Globally, land take remains a significant impact.

[88] 'Permanent pasture' as defined in EU Regulation 73/2009 on direct CAP support for farmers

[89] Losey, J. and M. Vaughan (2006), "The Economic Value of Ecological Services Provided by Insects", BioScience, Vol. 56/4, pp. 311-323, http://dx.doi.org/10.1641/0006- 3568(2006)56[311:TEVOES]2.0.CO;2.

Is carried out in a way that the pressures on biodiversity from chemicals and nutrient leaching are halted or significantly reduced, leading to a reduction of ongoing negative impacts and allowing for the subsequent recovery of biodiversity and ecosystems; AND

Is actively creating or enhancing high-biodiversity landscape features or areas within the farm holding, adapted to local conditions.

They variously align with the following key elements of the EU Biodiversity Strategy:

25% of the EU's agricultural land must be organically farmed by 2030.

At least 10% of agricultural area under high-diversity landscape features

Reduce by 50% the overall use of – and risk from – chemical pesticides by 2030 and reduce by 50% the use of more hazardous pesticides by 2030, and

They are also consistent with the Farm to Fork[90] strategy (part of the European Green Deal), which highlights the urgent need to reduce dependency on pesticides and antimicrobials, reduce excess fertilisation (especially nitrogen and phosphorous), increase organic farming and reverse biodiversity loss. The introduction of sustainable criteria on agriculture may also contribute to strengthen food security in developing countries, as well as strengthen soil and plant carbon sinks globally.

Option A: Large areas of the farm holding are under high-biodiversity landscape features or are otherwise biodiversity rich

The inclusion of criteria relating to the creation or enhancement of high-biodiversity landscape features is deemed important as agriculture covers [39.1%[91]] of land area in the EU. And as such, this sector has an important role to play in ensuring the overarching goals of the EU Biodiversity Strategy to 2030 to put Europe's biodiversity on the path to recovery by 2030 are met, including restoring degraded ecosystems. That Strategy notes that to provide space for wild animals, plants, pollinators and natural pest regulators, there is an urgent need to establish at least 10% of agricultural area in the EU under high-diversity landscape features.

[90] From Farm to Fork | European Commission (europa.eu)

[91] EURSTAT: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Land_use_statistics

The level of habitat fragmentation remains highly undesirable in the EU. After intensification, this is the second most widespread and severe pressure according to a study based on over 300 peer-reviewed papers and spatially explicit EU-wide taxonomic group assessment (Nel et al., 2020). Active regeneration of landscape connectivity is needed to restore landscape heterogeneity and bend the curve for biodiversity. Restoring field margins, hedges, grass strips, lines of trees, patches of uncultivated land in agro-ecosystems is a matter of urgency.

The EU's Biodiversity Strategy to 2030 aims for "all of the world's ecosystems" to be restored by 2030, and "from today...put on the path to recovery". The global perspective also necessitates measures to ensure biodiversity and ecosystem services are integrated into "working landscapes" such as agriculture, which continues to expand in area and become "increasingly intensive and homogenous" - leading to analysis that a minimum of 20% (to 50% in some places) of working landscapes need to be restored as functional habitat (Garibaldi et al., 2020).

Option B: **Ensuring a sustainable farm-gate nitrogen balance**

Excessive nitrogen losses caused by agricultural production have significant negative effects on biodiversity and ecosystems. Eutrophication caused by excess nutrients (nitrogen as well as phosphorus) can result in increases in weeds and algae, reduced oxygen levels and subsequent biodiversity loss[92]. Excess reactive nitrogen leads to direct foliar damage of the plants as well as to harmful acidification. Especially problematic is the nitrogen excess to species and communities that are adapted to low nutrient levels, or are poorly buffered against acidification. Evidence is strong that ecological communities respond to the accumulated pool of plant-available N in the soil and that because of this biodiversity has been in decline in Europe for many decades. Additionally, the exceedance of critical loads for nutrient nitrogen is linked to reduced plant species richness in a broad range of European ecosystems.[93]

[92] https://www.eea.europa.eu/airs/2018/natural-capital/agricultural-land-nitrogen-balance

[93] https://www.researchgate.net/publication/236268651_Nitrogen_deposition_as_a_threat_to_European_Terrestrial_Biodiversity

Many EU Directives aim to tackle excess nutrients and their consequences. The EU Nitrates Directive (EU, 1991) aims to reduce water pollution by nitrates from agricultural sources and prevent pollution of ground and surface waters. The EU Water Framework Directive (EU, 2000) aims at protecting and restoring the quality of all inland and coastal waters across Europe, and the National Emissions Ceilings (NEC) Directive (EU, 2016) sets out to reduce emissions through commitments for Member States and for the EU for important air pollutants, including nitrogen oxides (NO_x) and ammonia, which are nitrogen compounds.[94]

For the EU-Commission the reduction of nutrients losses is one of the major goals of the EU Biodiversity strategy to 2030 COM/2020/380. With it, it aims to reduce nutrient losses by at least 50%, while reducing the use of fertilisers by at least 20% by 2030[95].

At the end reducing nutrients such as nitrogen can only be implemented on the farm holding via balancing nutrient inputs with the outputs of the agricultural system[96]. The option developed here proposes a way with which farms have guidelines which lead to an effective and efficient use of nitrogen, minimizing losses.

A note for further application: This option has currently been developed for SC to biodiversity and ecosystems but is equally applicable to the SC of sustainable use and protection for water and marine resources and SC to pollution prevention and control – as the balanced nitrogen fertilization tackles the overall reduction of nitrogen emissions.

Option C: Limiting the use of synthetic plant protection products and copper

This option addresses the widespread use of chemical plant protection products, which poses a major problem for biodiversity and ecosystems. It provides farm holdings with the option to limit the use of synthetic plant protection products by either complying with EU standards for organic farming or proving that they produce without the above-mentioned products. The scientific evidence for the effectiveness of organic farming and the harmfulness of plant protection products is given in Table 3.

[94] https://www.eea.europa.eu/airs/2018/natural-capital/agricultural-land-nitrogen-balance

[95] https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1590574123338&uri=CELEX:52020DC0380

[96] https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1590574123338&uri=CELEX:52020DC0380

This option is aligned with various EU policies supporting an extension of organic farming in the EU. The European Green Deal, the Biodiversity Strategy and the Farm to Fork Strategy aim to achieve in 2030 an agricultural area under organic farming of 25%. The option is also aligned with the goal of the Farm to Fork Strategy to reduce the overall use and risk of chemical pesticides by 50% and the use of more hazardous pesticides by 50% by 2030.

Approach to setting the criteria

The tables below present a number of criteria that must be met in order for the activity to be recognized as making a substantial contribution to the protection and restoration of biodiversity and ecosystems. These criteria cover a range of management aspects relating to the land, soil, water, agricultural infrastructure and other assets underpinning the crop production activity taking into account the many ways crop production impacts on biodiversity and ecosystems as described above. Criteria marked with a '^' represent safeguard levels of performance. Together, as a bundle, compliance with these practices would demonstrate a substantial contribution to the protection and restoration of biodiversity and ecosystems.

[Most] of these practices are described in qualitative terms, though some have quantitative thresholds. Preference has been given to the inclusion of quantitative thresholds where available and usable at farm level, with supporting scientific evidence provided.

The intention has been to set base criteria that are not reliant on local regulations or standards, that can be interpreted in all locations and contexts globally, and use globally recognized terminology. Once these criteria are established, then existing regulations or legislation, or labelling or certification schemes used in the industry can be evaluated for compliance with these base criteria. Where compliant, that regulation, scheme or other would then represent an established 'proxy indicators' for all or part of these criteria, increasing the usability of the criteria.

This process has been started here, with the DNSH criteria taking guidance from, and looking to build on, the cross-compliance measures of the Common Agricultural Policy (CAP), and in particular the current proposals for the post-2020 CAP per Annex III of COM(2018)392. When that regulation is enacted, cross references will be added from these criteria to the relevant article in the regulation.

Selection of the criteria

Scientific literature identifies a wide range of possible practices available in the agricultural sector to address the impacts of crop production on biodiversity and ecosystems. For the purpose of establishing a set of criteria and thresholds which identify when crop production delivers a substantial contribution to biodiversity and ecosystems, individual criteria were identified for which: 1) there is sufficient existing scientific knowledge and consensus on the effects; and 2) the scale, certainty and consistency of effects is sufficiently demonstrated.

It is noted that the scientific literature provides limited guidance on what combination of criteria should be applied together as a minimum at farm level in different conditions to deliver a substantial contribution to biodiversity and ecosystems. Given the heterogeneity of agriculture, it is especially challenging to establish a set of one size fits all criteria. However, it is the view of the majority of the group that these criteria are globally relevant, with the in-built flexibility on options for demonstrating compliance, they can be applied globally. To assist with this, the criteria are not tied to specific EU regulations, though cross-reference is made where appropriate to those regulations to assist EU users.

With that in mind, the tables below indicate the management practices selected as the bundle of essential practices that, deployed collectively, should deliver a substantial contribution with relatively high certainty across a range of biophysical and farming conditions. It is noted that given heterogeneity of farms, deployment of the same bundle of practices may result in different biodiversity impacts farm to farm, but overall, it is expected that deployment of this bundle will deliver a substantial contribution in the majority of cases. It will, of course, be necessary to regularly review this list of practices to integrate new advances in scientific knowledge.

Supporting evidence for each of the criteria is given in Tables 1, 2, 3 and 4.

Recommendations for priority consideration for next phase of criteria development

The following options were discussed and believed to have merit in terms of delivering a substantial contribution to Biodiversity and Ecosystems. Due to time constraints, these options have not been developed further at this time, but it recommended that priority consideration be given to them in the next phase of criteria development:

- The farming of 'traditional', landrace[97], or 'conservation' varieties that are important for genetic diversity.
- Farming in greenhouses / other indoor environments.
- Nitrogen and phosphorus should be in line with sustainable farm-gate balance for the reasons described above. In the following we propose criteria for addressing nitrogen as scientifically based approaches to tackle this problem are furthest developed. But integrating phosphorus in the next stages of the taxonomy is strongly recommended.

Table 1: Criteria for Option A: Considerable areas of the farm holding are under high-biodiversity landscape features or are otherwise biodiversity rich

1. Creation and maintenance of High Biodiversity Landscape Features (HBLFs)	
The activity meets at least one of the following four options: **OPTION 1: Non-productive HBLFs** **1.1.1. The activity maintains non-productive HBLFs in at least 20% of its farm area[98].** Specifically:	These criteria support high biodiversity farming systems as well as improvements to the biodiversity within intensive farming. Examples of agroecosystems this may apply to include High Nature Value farming systems (as categorised in Europe), cork-oak savannah (dehesa/montado); extensive orchards, olive and almond groves, barrocal; mixed species shea parklands; shade-grown coffee and spice agroforestry. The non-productive and productive HBLFs defined opposite will include any natural or

[97] As defined by the European Environment agency (landrace — European Environment Agency (europa.eu)): a crop cultivar that evolved with and has been genetically improved by traditional agriculturalists, but has not been influenced by modern breeding practices. [GBA] - farmer-developed cultivars of crop plants which are adapted to local environmental conditions. [CUB].

[98] In this document," farm area" refers to UAA (i.e., does not include farm buildings or non-agricultural land owned by the farm)

• If the current % is below 20%, then 20% non-productive HBLF is reached within a year (I.e., one annual growing cycle). • If the current % is above 20%, then this % is maintained, that is, existing HBLFs are not destroyed or converted. **1.1.2. Total pesticide use in the whole farm is kept or reduced to below 50% of the baseline of the sector average in the region within 3 years**. **1.1.3. No use of fertiliser, plant protection products or other chemicals within 10m of non-productive HBLFs** **1.1.4. No vegetation cutting / grazing / mowing of non-productive HBLFs during sensitive times of year** such as bird breeding and plant flowering & seed development **1.1.5. No increases in drainage efficiency** in non-productive HBLFs such as replacement of drainage ditches with underground pipes. **1.1.6. Invasive alien species are removed within non-productive HBLFs to the extent possible without recourse to chemicals**.	semi-natural on-farm habitats. Natural habitats are natural ecosystems hardly altered by human activities. Semi-natural habitats "have ecological assemblages that have been substantially modified in their composition, balance or function by human activities. They may have evolved through traditional agricultural, pastoral or other human activities and depend on their continuation to retain their characteristic composition, structure and function. Despite not being natural, these habitats and ecosystems often have high value in terms of biodiversity and the services they provide.[100]". On farms, examples of semi-natural habitats include unimproved pasture, hedgerows, woodland, farm ponds, etc. *Benefits of HBLFs* The EU's Biodiversity Strategy to 2030 stipulates that "To provide space for wild animals, plants, pollinators and natural pest regulators, there is an urgent need to bring back at least 10% of agricultural area under high-diversity landscape features. These include, inter alia, buffer strips, rotational or

[100] "Note, the Habitats Directive includes both 'natural' and 'semi-natural' habitats but does not itself define them. The European Red List of habitats (Janssen et al., 2016) also uses both terms. These are defined in various ways, the wording quoted is from the European Investment Bank. (2018). European Investment Bank, Environmental and Social Standards. Luxembourg. Similarly: IPBES: " An ecosystem with most of its processes and biodiversity intact, though altered by human activity in strength or abundance relative to the natural state".

Methodological notes: *Non-productive HBLFs[99] are features primarily for habitat and biodiversity, usually but not always native vegetation based. If a yield is taken, it is incidental and a by-product to the management of the habitat (e.g., hay cut from fallows).* *Specifically:* • *Native vegetation non-productive HBLF: riparian vegetation, native trees (scattered or in groups), non-crop areas within the farm such as buffer strips, field margins with wildflowers or grass, rotational or non-rotational fallow land, hedges.* • *Other non-productive HBLF: non-productive trees, terrace walls, stone walls, and ponds.* *The baseline types, extent and condition of the occurring HBLF must be identified in the Biodiversity and Ecosystems impact assessment, surveyed registered and the extent and condition of HBLF are monitored.* *The HBLF types and locations must be in line with local protection objectives if such exist. The Farm Sustainability Management Plan (FSMP) must explain how national and local priority species and habitats, present or*	non-rotational fallow land, hedges, non-productive trees, terrace walls, and ponds." High diversity landscape features also contribute to the EU Biodiversity Strategy's target that 'uptake of agroecological practices is significantly increased'. Such functions can include nitrogen fixation, soil building and erosion control, wind breaks, shading, pest management, improved rain absorption, etc (e.g. Holland et al., 2017; Garibaldi et al 2020). Such landscape features support biodiversity and ecosystem services such as habitat provisioning, soil erosion control, microclimate regulation. The provision of essential ecosystem services by linear elements is increasingly recognized (van der Zanden et al. 2013). As ecological infrastructure elements, they provide a habitat for species such as farmland birds, invertebrates and mammals. They improve the functioning of agroecosystems at landscape level. Their exact role depends on the context and their spatial interaction. They can improve habitat connectivity functioning as corridors or stepping-stones for species. Extensive agricultural management creates and maintains semi-natural habitats – with a diverse fauna and flora. A number of

[99] In the EU HBLF should be recognisable on the LPIS

potentially present in the farm, are being supported by the HBLF. *The FSMP must describe how HBLFs are being created and managed to ensure these criteria are met.* **OR OPTION 2: Productive HBLF** **1.2. The activity maintains biodiversity rich farmed area in good condition, or improves their condition substantially, at least on 30% of its area** *Methodological notes:* *Productive HBLF are biodiversity rich agroecosystems based on native plant species that are farmed for a productive yield. Specifically:* • *High-biodiversity extensive meadows, heathland; agroforestry with native permanent ground, shrub, or canopy layer of documented high biodiversity value.* • *Other agroecosystems, such as rice paddies under biodiversity-friendly management, where a convincing conservation rationale is presented (e.g., presence of priority species).* *The FSMP covers the entire farming entity or site and shows positive biodiversity impacts*	biodiverse semi-natural habitats depend on agricultural management. Terrestrial habitats and non-bird species such as grassland habitats, vascular plants and arthropods are particularly impacted by the abandonment of grassland management, most importantly the ceasing of traditional or extensive grassland management. Among others, these pressures also badly affect pollination capacities. Reptiles and smaller mammals are especially affected by fragmentation due to the removal of small landscape features, which reduces landscape connectivity and leads to a loss of habitat area essential for food supply, shelter and breeding sites. Birds, however, are most affected by the conversion of one type of agricultural land use to another (e.g., this ranges from conversion from extensive to intensive agricultural land to more subtle changes such as a change in the type of crop grown) and by drainage (State of nature in the EU, 2020). Fallow land provides space for biodiversity and co-benefits to soil productivity, soil health, nutrient balance, pest and disease control. E.g. The decline of farmland birds in Spain is strongly associated to the loss of fallow land (Traba and Morales, 2019) https://www.nature.com/articles/s41598-019-45854-0, fallow land is also important for a number of ground-nesting birds and

regarding habitats and species under Annex I of the Habitats Directive or equivalent legislation. It includes a recent biodiversity inventory to set the baseline and clearly describes which measures are to be taken to maintain the good condition or to improve habitat/species status and avoids harm to biodiversity. The FSMP is based on the site and management specificity of impacts. **OR OPTION 3: Non-Productive + Productive HBLFs** **1.3. The activity maintains high-biodiversity non-productive landscape features and biodiversity-rich farmed area in good condition in at least 30 % of its area or reaches 30% within one year if the baseline is < 30%** (I.e., a combination of 1 and 2 above) *Methodological note:* *The methodological notes for Option 1 and Option 2 described above apply here, for the non-*productive *and productive HBLFs respectively.* **OR OPTION 4: Conservation schemes**	some threatened birds of dry cereal steppe land. "Margins also have a range of associated fauna, some of which may be pest species, while many are beneficial, either as crop pollinators or as pest predators. The biodiversity of the margin may be of particular importance for the maintenance of species at higher trophic levels, notably farmland birds, at the landscape scale. Margins contribute to the sustainability of production, by enhancing beneficial species within crops and reducing pesticide use." Field margins also contribute to buffering pollutant movement to adjacent habitats, reducing soil erosion, maintaining landscape diversity (Marshall and Moonen, 2002, Field margins in northern Europe: their functions and interactions with agriculture. Agriculture, Ecosystems and Environment 89 (2002) 5–21.) Landscape features offer corridors and stepping-stones interconnecting wild populations across landscapes that might otherwise form barriers or sinks (Garibaldi et al., 2020). Lastly, in addition to intrinsic values, native species, and their habitats, have potential for new discoveries and unanticipated uses of biodiversity (e.g., new medicines or materials), can mitigate the spread of invasive species, increase the

1.4. At least 30% of the farmland area is under an official conservation scheme as recognised by national authorities for priority species or habitats (e.g., habitats and species of Annex 1 of Habitats Directive, or locally applicable equivalents if not in Europe, and national species Red Lists). *Methodological note:* *The FSMP sets out, with regular monitoring:* • *Ongoing and time-specific conservation targets* • *Evidence of successful compliance with conservation targets*	range of nature's contributions to people, including the basis for religious, spiritual and other cultural experiences (Díaz et al., 2018). Díaz, S., Pascual, U., Stenseke, M., Martín-López, B., Watson, R. T., Molnár, Z., & Polasky, S. (2018). Assessing nature's contributions to people. Science, 359, 270–272. *Selecting the threshold* Many studies show significant critical thresholds of habitat on farms between 10-14% for a range of species and taxa (Opperman, 2008; Biogea, 2020), such as: birds (Traba & Morales, 2019; Walker et al, 2018; Mechtry-Stier et al, 2014 – includes hares; Aebischer & Ewald, 2004), and pollinating and other insects (Humbert et al, 2010; Pfister et al, 2020). Sometimes more habitat is required for farmland species (20-40%, Oppermann, et al 2020). Garibaldi et al (2020) call for native habitats within "working landscapes" such as agriculture, to be globally increased to "at least 20%", and "even more than 50% native habitat restoration is needed in particular landscapes". In Germany, 15-20% high ecological value land is needed in the agricultural landscape to meet national goals for protecting and promoting biodiversity in the agricultural landscape." IEEP (2020) also call for 'no less than 20%'. Such HBLFs can be retained or restored while minimizing trade-offs with working

	landscape productivity (Garibaldi et al, 2020) and in many cases provide increases in productive yields (see Pywell & Heard, 2015; Daimene et al., 2019), so that commonly "the area we can devote to native habitats without losing production ranges from 13 to 27%" (Garibaldi et al, 2020).

Table 2: Criteria for Option B: Ensuring a sustainable farm gate nitrogen balance

Criteria	Considerations / rationale
1. Ensure balanced fertilization and efficient use of nitrogen	
1.1. N-Surplus limits: The agricultural holding must show annually that over a rolling average of three years: • the N-surplus from mineral fertiliser does not exceed 30 kg N/ha/a, • the total N-surplus from mineral fertilizer and organic matter does not exceed 90 kg N/ha/a, • the N-surplus from organic matter is never above the allowed limit which increases depending on N-org excretion	*The farm-gate balance* Setting a limit for the nitrogen surplus on farm-scale instead of limiting the permitted amount of applicable nitrogen in fertilizers or setting a limit for nitrogen calculated by a soil balance provides the farmer with the flexibility to manage nitrogen within all their farming operations flexibly, to optimize nitrogen use at every point of the usage and use it according to her needs and economic criteria. It also prevents pollutions swapping which can happen when nutrients are poorly managed at animal housing stage, leading to a lower nutrient supply for the agricultural area. A mismanagement which would not be accounted for with the application limit

produced at or imported to the farm (see Figure 1)[101].

This to be demonstrated with the support of a digital tool that is accepted by the EU, national or regional bodies or in written form.

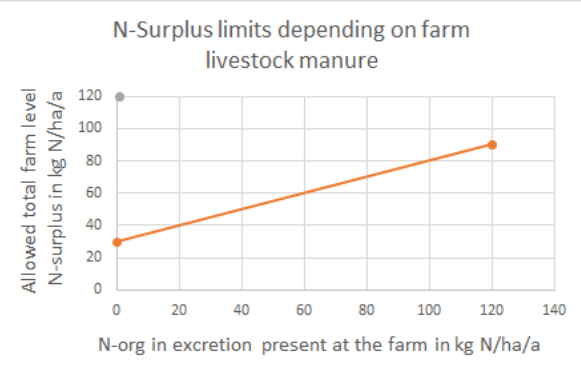

Figure 1: Defining the permissible N-surplus limit at farm level (measured with

nor with a soil balance limit. The farm gate nitrogen balance is also designed in a way that it can be applied by crop farms without animals, mixed farms or animal farms without cropping area when they can prove that manure is applied according to the here defined principle. Several studies consider the farm gate nitrogen balance indicator the most integrative and transparent indicator in nutrient management[110] [111] [112].

Additionally, other indicators, such as e.g., the farm nutrient use efficiency (NUE) can be deduced from the farm nitrogen balance[113]. Complying with farm nitrogen balance limits has been made obligatory by Germany[114], Romania and Switzerland so far as a tool to implement the Nitrate Directive and to reduce

[101] This means for example that with a prevalent manure of 60 kg N, the allowed surplus of the farm from any N (mineral or organic) is 60kg.

[110] Oenema, O.; Kros, H.; de Vries, W. Approaches and uncertainties in nutrient budgets. Implications for nutrient management and environmental policies. Eur. J. Agron. 2003, 20, 3–16. [Google Scholar] [CrossRef]

[111] Bach M and Frede H-G 2005 Assessment of agricultural nitrogen balances for municipalities—example Baden-Wuerttemberg (Germany) Eur. Water Manage. Online 1–15

[112] SRU 2015 Stickstoff: Lösungsstrategien für ein drängendes Umweltproblem: Sondergutachten Sachverstaendigenrat für Umweltfragen (Berlin: Hausdruck)

[113] Löw P, Karatay Y N and Osterburg B 2020 Nitrogen use efficiency on dairy farms with different grazing systems in northwestern Germany Environ. Res. Commun. 2 105002

[114] Stoffstrombilanz – German legislation on farm budget implementation (https://www.gesetze-im-internet.de/stoffbilv/StoffBilV.pdf

the farm nitrogen surplus, see text), depending on prevalent livestock excretion on the farm, measured in kg N/ha/a in manure. ***1.2. Minimum Nitrogen Use Efficiency:*** Each farm holding utilizes nitrogen at least with a minimum NUE (Nitrogen Use Efficiency) as follows: NUE crops: 70% NUE granivores: 40% NUE ruminants: 30% To be demonstrated with the data collected in its farm-gate balance sheet. Notes: • NUE is defined here as the ratio of total N output in products of a farm and total N inputs: NUE = [Σ(N output) / Σ(N input)] * 100 (see Table 1).	nutrient surpluses[115]. The use of farm nutrient budgeting such as the farm gate nitrogen balance as agri-environmental indicator is well established and has been highlighted by OECD and EU[116] [117]. There is also evidence that the farm gate indicator is able to indicate well that high nitrogen surpluses lead very often also to high nitrogen concentrations in groundwater. Hansen et al. (2017)[118] found significant correspondence between developments in N surplus and nitrate concentrations in upper groundwater for four subsequent development periods for Danish agriculture in the period 1946–2012. Dalgaard et al. (2012)[119] calculated gross farm budgets for six European landscapes in Poland, the Netherlands, France, Italy, Scotland and Denmark as an indicator for N losses. The authors found significant correlations of N surplus to both nitrate concentrations in

[115] Klages S, Heidecke C, Osterburg B, Bailey J, Calciu I, Casey C, Dalgaard T, Frick H, Glavan M, DHaene K, Hofman G, Amorim Leitão I, Surdyk N, Verloop K, Velthof G (2020) Nitrogen surplus - A unified indicator for water pollution in Europe? Water MDPI 12(4):1197)

[116] Eurostat and OECD (2013): Eurostat Nutrient Budgets—Methodology and Handbook, Version 1.02.

[117] EEA (2005): Agriculture and Environment in EU-15—The IRENA Indicator Report. Agriculture and Environment. p. 128. Available online: https://www.eea.europa.eu/publications/eea_report_2005_6.

[118] Hansen, B.; Thorling, L.; Schullehner, J.; Termansen, M.; Dalgaard, T. Groundwater nitrate response to sustainable nitrogen management. Sci. Rep. 2017, 7, 1–12. [Google Scholar] [CrossRef]

[119] Dalgaard, T.; Bienkowski, J.F.; Bleeker, A.; Dragosit, U.; Drouet, J.L.; Durand, P.; Frumau, A.; Hutchings, N.J.; Kedziora, A.; Magliulo, V.; et al. Farm nitrogen balances in six European landscapes as an indicator for nitrogen losses and basis for improved management. Biogeosciences 2012, 9, 5303–5321. [Google Scholar] [CrossRef]

- Farms that produce more than one product type must apply a weighted minimum NUE. This weighted NUE is calculated by multiplying the share of the N-output of the farm with the according NUE and summing the numbers up. (For example, if a farm produces 50% ruminant products and 50% granivore products, the resulting weighted NUE would be 35% (0.5*30%+0.5*40%)).

- In order to take into account the additional N used to produce feed, the imported N in feed on the input side must be multiplied with 2 (see methodological notes d).

1.3. Combining Minimum NUEs with surplus limits

Each farm must show that its surplus is below the limits defined in 1.1 and that its NUEs are above the NUEs defined in 1.2. To give an example, a cropping farm produces 170kg wheat with 200kg mineral fertilizer. This farm has an NUE of 85% which is well above the NUE of 70% and a surplus of 30kg N/ha/yr from mineral fertilizer, which is also in the permitted surplus range.

soils and groundwater). Additionally, the indicator is able to catch also ammonia emissions, which are also an important source of eutrophication.

Defining minimum NUE limits

In order to ensure that all farms considered in this criterion do not only have environmentally acceptable low surpluses, but also a productivity which ensures an efficient use of nitrogen (NUE), we are defining minimum levels of nitrogen use efficiency. This approach, of combining an N-surplus limit with NUE, has also been proposed by the EU Nitrogen Expert Panel (EUNEP)[120] (See Figure 2) for examining the performance of the farm management.

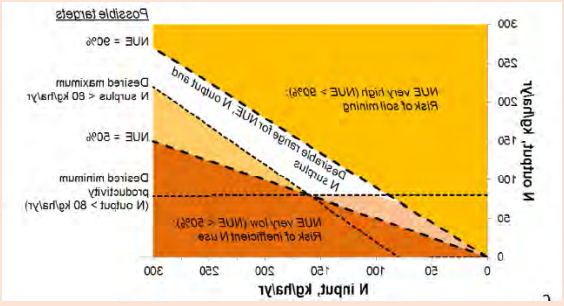

Figure 2: The NUE-Approach developed by the EUNEP. Lower and upper bounds for NUE values, a minimum N yield level and a limit for N surplus are defined to find the optimal values for N-input and N-

[120] *Nitrogen Use Efficiency (NUE) - an indicator for the utilization of nitrogen in agriculture and food system* http://www.eunep.com/reports/

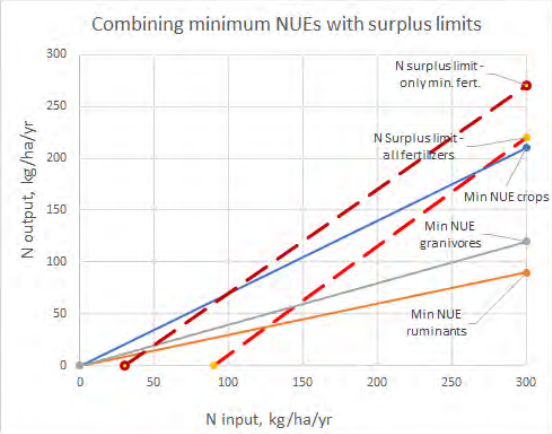

Figure 3: The possible fertilization range for the farms is the area above the surplus limit and the NUE-line. This is an exemplary figure as NUEs depend on the specific product typ. Dashed lines are allowed surpluses for total fertilization and mineral fertilization only (see figure 1). Straight lines are indicative NUEs for the three types of products (crops, granivores, ruminants).

1.4. Application limit for organic fertilizer: The agricultural holding must show that the yearly quantity of organic fertilizer applied does not exceed:

120 kg N/ha for cropping land

140 kg N/ha for grassland land

output (white area). We are not including the productivity in our approach as the range for N-yield levels is too wide to find a general value. Source: http://www.eunep.com/reports/

In order to adapt the EUNEP-methodology to different farm types, we set minimum NUE-limits for crops, ruminants and granivores and defines surplus limits depending on manure excretion (see Figure 1). The NUE minimum limits are derived from the lower boundaries of values given by the EUNEP[121] for balanced N-fertilization as well as from a recent paper by Hutchings et al (2020)[122] which calculated typical NUEs for different farm types in Northern and Southern Europe. We are abstaining from using minimum productivity levels (as also suggested from EUNEP), as productivity varies enormously between different crops as well as livestock products and we would have to define too many different productivity levels.

[121] http://www.eunep.com/wp-content/uploads/2017/03/Report-NUE-Indicator-Nitrogen-Expert-Panel-18-12-2015.pdf

[122] Nicholas J. Hutchings, Peter Sørensen, Cláudia M.d.S. Cordovil, Adrian Leip, Barbara Amon, Measures to increase the nitrogen use efficiency of European agricultural production, Global Food Security, Volume 26, 2020, 100381,ISSN 2211-9124, https://doi.org/10.1016/j.gfs.2020.100381. (https://www.sciencedirect.com/science/article/pii/S2211912420300353)

This application limit applies for each ha and is not averaged over the UAA of the farm. *Methodological notes:* *a) Measuring the farm gate nitrogen balance* The farm gate nitrogen balance (equivalent to the farm N surplus defined by EUNEP) per unit area (kg N/ha/a) is the difference between nitrogen inputs and nitrogen outputs per unit area to and from the farm. The nitrogen output is calculated from the total amount of products and the N content of the products exported from the farm (crop and animal). The nitrogen input is calculated from the total amount of inputs and their N content in a production year[102].	*Setting tailored limits for different farm types* The method for defining the sustainable limit for farm gate nitrogen surpluses depending on the prevalent manure on the farm and limiting the surplus for mineral fertilizer has been derived from the currently discussed proposition of German legislation on an improved farm gate balance implementation[123]. The reason for such an approach is the importance of the efficient use of organic fertilizer. Mineral fertilizer has an important role in feeding the global population and it can be used with smaller surpluses than organic fertilizer, but its easy availability reduces the efficient use of organic fertilizer. In regions with high livestock densities, farmers are often faced with the problem of an oversupply of manure which they have difficulties to apply on farmland according to legislation. Brink et al.

[102] EU Nitrogen Expert Panel (2016) Nitrogen Use Efficiency (NUE) – Guidance document for assessing NUE at farm level. Wageningen University, Alterra, PO Box 47, NL-6700 Wageningen, Netherlands. http://www.eunep.com/wp-content/uploads/2019/09/NUE-Guidance-Document.pdf

[123] Taube, F; Bach, M; Breuer, L; Ewert, F; Fohrer, N; Leinweber, P; Müller, T; Hubert, W (2020): *Novellierung der Stoffstrombilanzverordnung: Stickstoff- und Phosphor-Überschüsse nachhaltig begrenzen. Fachliche Stellungnahme zur Novellierung der Stoffstrombilanzverordnung. Texte 200/2020. Umweltbundesamt. Dessau-Roßlau. Download unter: https://www.umweltbundesamt.de/publikationen/novellierung-der-stoffstrombilanzverordnung*

b) Inputs and outputs that must be accounted for		2011[124] have shown that in areas with high livestock densities manure N can even have a negative economic value. The problem of inefficient use of fertilizers can be seen when comparing nitrogen efficiencies with surpluses in different regions. In the EU the efficiency of N-use is less than 50% in countries with an N surplus above 80 kg/ha/yr (the Netherlands, Belgium, Denmark and UK), between 50% and 70% in countries with an N surplus between 50–80 kg/ha/yr and more than 70% in countries with an N surplus below 50 kg/ha/yr, except for Portugal and Spain[125]. Globally, it is estimated that about 57% of anthropogenic nitrogen fixation results from the manufacture of nitrogen containing fertilizers[126]. This large amount must be reduced as it comes as additional input into the nitrogen cycle. An additional problem is the high energy demand of the industrial manufacturing
Nitrogen input	Nitrogen output	
• Mineral fertilizers • Imported feed (multiplied with the inverse NUE of the feed production if known OR with a factor of 2)[103] • Biological nitrogen fixation • Seed and planting material	• Crop products • Exported animals • Animal products (milk, egg, wool) • Exported feed • Exported compost and sewage sludge and other organic fertilizer	

[103] See below for an explanation.

[124] *Brink, C., van Grinsven, H., Jacobsen, B.H., Rabl, A., Gren, I.-M., Holland, M., Klimont, Z., Hicks, K., Brouwer, R., Dickens, R., Willems, J., Termansen, M., Velthof, G., Alkemade, R., van Oorschot, M., Webb, J., 2011. Costs and benefits of nitrogen in the environment, in: Sutton, M.A., Howard, C.M., Erisman, J.W., Billen, G., Bleeker, A., Grennfelt, P., van Grinsven, H., Grizzetti, B. (Eds.), The European Nitrogen Assessment. Cambridge University Press, Cambridge, pp. 513–540.* https://doi.org/bh59rj

[125] OECD (2006). Key Environmental Indicators. OECD Environment Directorate, Paris, France. http://www.oecd.org/dataoecd/32/20/31558547.pdf

[126] Erisman , J. W. , Domburg , N. , de Vries , W. et al. (2005). Th e Dutch N-cascade in the European perspective. Science in China, Series C, Life Sciences, 48, 827–842.

• Bedding material (straw, saw dust) • Atmospheric N deposition • Imported animals • Imported compost and sewage sludge and other organic fertilizer • Imported animal manure[104]	• Exported animal manure[105] • Exported digestates *	of reactive nitrogen, which uses approximately 2% of world energy[127]. *The surplus limits* The different values for the nitrogen surplus limits leading to environmentally acceptable levels of nitrogen emissions to the environment are based on a publication of the EU Nitrogen Expert Panel[128], the proposition of the Commission of Agriculture at the German Environment Agency for Improving the CAP[129] (proposing a maximum surplus of 50 kg N/ha/a as precondition for receiving EU-subsidies)

[104] Analysis of the nitrogen content of a representative manure sample of the bulk of the material from which it is taken has to be conducted in a regular basis. Rules for that are determined in the measure for the fertilizer plan.

[105] Analysis of the nitrogen content of a representative manure sample of the bulk of the material from which it is taken has to be conducted in a regular basis. Rules for that are determined in the measure for the fertilizer plan.

[127] Sutton M.A., Bleeker A., Howard C.M., Bekunda M., Grizzetti B., de Vries W., van Grinsven H.J.M., Abrol Y.P., Adhya T.K., Billen G.. Davidson E.A, Datta A., Diaz R., Erisman J.W., Liu X.J., Oenema O., Palm C., Raghuram N., Reis S., Scholz R.W., Sims T., Westhoek H. & Zhang F.S., with contributions from Ayyappan S., Bouwman A.F., Bustamante M., Fowler D., Galloway J.N., Gavito M.E., Garnier J., Greenwood S., Hellums D.T., Holland M., Hoysall C., Jaramillo V.J., Klimont Z., Ometto J.P., Pathak H., Plocq Fichelet V., Powlson D., Ramakrishna K., Roy A., Sanders K., Sharma C., Singh B., Singh U., Yan X.Y. & Zhang Y. (2013) *Our Nutrient World: The challenge to produce more food and energy with less pollution.* Global Overview of Nutrient Management. Centre for Ecology and Hydrology, Edinburgh on behalf of the Global Partnership on Nutrient Management and the International Nitrogen Initiative

[128] *EU Nitrogen Expert Panel (2015) Nitrogen Use Efficiency (NUE) - an indicator for the utilization of nitrogen in agriculture and food systems. Wageningen University, Alterra, PO Box 47, NL-6700 Wageningen, Netherlands*

[129] Kommission Landwirtschaft am Umweltbundesamt, UBA (2013): Die Legislativ-Vorschläge zur GAP-Reform – gute Ansätze, aber für die Umwelt nicht gut genug (https://www.umweltbundesamt.de/publikationen/legislativ-vorschlaege-zur-gap-reform)

• Irrigation water • Imported digestates *		and the publication on the German nutrient balance regulation (cited above). *The application limit* Nitrogen from manure cannot taken up by plants when applied in very large amounts. Starting from an application rate of 120 kg N/ha the efficiency of the nitrogen use decreases over proportionally and the risk of leaching increases[130]. The German Environment Agency proposes therefore a manure application limit of 120 kg N/ha/ from cropland and of 140 kg N/ha/a for grassland[131]. Also, the EU-Commission states that "The definition of fertilizer application standards that ensures balanced fertilisation remains one of the most important and challenging measures"[132].
Table 1: List of in- and outputs in the balance * Anaerobic digestates are not included in the EUNEP document but can contribute substantially to nitrogen surpluses and need therefore be integrated. Factors of N-content in digestates need to be obtained regionally. If this is not possible, we recommend for calculation for digestates from energy plants only a N-content of 0,85% and for digestates from organic manure and energy plants (50/50) a N-content of 0,71%[106]		

[106] https://www.ktbl.de/webanwendungen/wirtschaftlichkeitsrechner-biogas

[130] Gutser, R; Ebertseder, T; Schraml, M; von Tucher, S; Schmidhalter, U (2010): Stickstoffeffiziente und umweltschonende organische Düngung. In: KTBL-Schrift 483. KTBL-/vTI-Tagung 8-10. Dezember 2010. Emissionen landwirtschaftlich genutzter Böden. Darmstadt, S 31–50

[131] *Umweltbundesamt 2021, Perspektiven für eine umweltverträgliche Nutztierhaltung in Deutschland, UBA-TEXTE 33/2021*

[132] REPORT FROM THE COMMISSION TO THE COUNCIL AND THE EUROPEAN PARLIAMENT on the implementation of Council Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources based on Member State reports for the period 2012–2015

c) In case that manure is imported to a farm or exported from a farm, the losses that occur during management (storage or housing) of the manure are attributed to the exporting farm and losses that occur during application are attributed to the importing farm. d) *Defining a factor for feed imported to the farm* In the case of livestock production, we comprise with the farm-gate balance approach two systems with different boundaries[107]. A farm which imports all or part of its feed has a comparatively lower N-input in the balance than a farm that would produce the same feed completely	*Digital tools to record balances* On national or regional level many digital tools exist which either can already estimate farm gate nitrogen surpluses or collect the necessary data in order to do so with small changes to the software. These are for example the cool farm tool[133], Ferticalc[134], AGROasesor[135], AZOFERT[136], Landsupport project h2020 Dynamic Armosa[137], (PIANO DI CONCIMAZIONE AZIENDALE - ON-FARM FERTILIZATION PLAN) Regione Campania (Italy)[138] or the tool N-Expert[139]. In the original proposal[140] of the EU-COM for the new CAP, the EU-COM proposed that "*Member States shall establish a system for providing the*

[107] EU Nitrogen Expert Panel (2016) Nitrogen Use Efficiency (NUE) – Guidance document for assessing NUE at farm level. Wageningen University, Alterra, PO Box 47, NL-6700 Wageningen, Netherlands. http://www.eunep.com/wp-content/uploads/2019/09/NUE-Guidance-Document.pdf

[133] https://coolfarmtool.org/

[134] http://www.uco.es/fitotecnia/fertilicalc.html.

[135] https://www.agrogestor.es/plataformas/plataforma-agroasesor/

[136] http://www.rmt-fertilisationetenvironnement.org/moodle/course/view.php?id=6

[137] https://www.landsupport.eu

[138] http://www.agricoltura.regione.campania.it/concimazione/PRCFA_intro.html

[139] https://www.igzev.de/projekt_type/n-expert-duengung-im-freilandgemuesebau/?lang=en

[140] Regulation on the new CAP post-2020 COM(2018) 392 Recital 22, Article 12.3 and ANNEX III

or partly on its own land[108]. In order to take account of the required N for the production of this feed and not to disadvantage mixed livestock farms over landless livestock farms, nitrogen imported via feed must be multiplied by the inverse NUE of the feed production if known OR with a factor of 2 (this means a conservative NUE of 50%, taking into account potential losses). e) *If the farm has insufficient used agricultural area (UAA)* If a livestock farm imports feed, to either completely or partly feed its animals and requires therefore additional cropping area for manure application, it must prove that the cropping farm imports its manure and applies it according to the rules defined in these criteria. This applies also when the farm exports manure in form of digestates. Ideally this is done in such a way that the importing farm also makes a farm gate nitrogen balance which	*Farm Sustainability Tool for Nutrients […] to beneficiaries, who shall use the Tool*." Although it is not part of the current proposal, the FaST tool[141] is still under development in DG Agri and is used by regions in Spain and Italy, as well as Estonia[142]. Although the primary purpose of the tool is to support fertilizer planning, it can easily be adopted to the purpose of generating farm gate nitrogen balance. *A farm-gate balance module could be integrated into the FaST as a quick and easy digital tool*.[143] We therefore recommend that the EU-Commission promotes and develops FaST as a global tool for farmers to obtain their nitrogen balances.

[108] The reason for that is that the production of feed requires additional or virgin N in form of fertilizer (or more rarely as biological fixation).

[141] https://ec.europa.eu/info/news/new-tool-increase-sustainable-use-nutrients-across-eu-2019-feb-19_en

[142] https://fastplatform.eu/about

[143] Policy recommendations from the EU-project SuMaNu - Sustainable Manure and Nutrient Management for reduction of nutrient loss in the Baltic Sea Region (*https://balticsumanu.eu/userassets/uploads/2021/04/Sumanu_policy-recommendation-2_FINAL.pdf*)

amends the balance of the exporting farm and which are submitted together. *f) If data is not available for three consecutive years* Then the agricultural holding can also rely on surplus calculations of the last two years, or if not available over the last year. This criterion is only valid for the farm at the beginning of the accounting period. *g) If no digital tool is available to the holding* The surplus must be estimated according to the rules set up by the EU Nitrogen Expert Panel in their guidance document for farms[109]. The farmer must follow the Tier-Approaches described in the document, meaning that more precise estimations of input or output factors must be used preferable to less precise estimations. For all elements in the table that are marked "net", imports and exports must be accounted for and the	

[109] EU Nitrogen Expert Panel (2016) Nitrogen Use Efficiency (NUE) – Guidance document for assessing NUE at farm level. Wageningen University, Alterra, PO Box 47, NL-6700 Wageningen, Netherlands, http://www.eunep.com/wp-content/uploads/2019/09/NUE-Guidance-Document.pdf

sum (negative or positive) must be integrated into the balance.	

Table 3: Criteria for Option C: Limiting the use of synthetic plant protection products and copper that harm biodiversity and ecosystems

Criteria	Rationale
1. Limitation of the use of plant protection products	
1.1 The holding is certified as organic under the EU-organic standard on production and labelling[144] or comparable standards outside of the EU aligned with the regulation[145]. **OR** **The holding only uses plant protection products** that are authorised under Article	*UAA under organic farming leads to higher biodiversity than UAA under conventional farming* The benefits of organic farming on ecosystem services related to biodiversity are numerous (Sandhu et al., 2010). The supervised management of plant diversity and distribution of semi-natural and cultivated areas usually observed on organic farms increase habitat possibilities and resources for natural enemies of pests at field and farm level (conservation

[144] EU regulation 834/2007 on organic production and labelling of organic products and EU regulation 889/2008 on rules governing organic production, labelling and control (https://ec.europa.eu/info/food-farming-fisheries/farming/organic-farming/organic-production-and-products_en)

[145] Such as ECOCERT certification available inside or outside EU, or equivalent.

24 of Regulation (EU) 2018/848 of the European Parliament and of the Council of 30 May 2018 on organic production and labelling of organic products and repealing Council Regulation (EC) No 834/2007[146] (OJ L 150, 14.6.2018, p. 1) except those plant protection products that are earmarked for substitution if only used for exceptional cases as defined by the EU REGULATION 834/2007 article 4.	biological control of pests, farmscaping (Smukler et al., 2010)), thus contributing to pest control in crops (Landis et al., 2000; Bengtsson et al., 2005). Pollinators and pollination are also increased in organic systems (Gabriel & Tscharntke, 2007; Rundlöf et al., 2008). Organic soil management practices are highly favourable to belowground, detritivore and aboveground arthropods, including natural enemies of pests (Birkhofer et al., 2008). Organic farming has also positive impacts on the overall biodiversity at landscape scale[147]. If conventional and organic farming are compared, several meta and review-studies show that in the vicinity and on organic farms biodiversity is higher than on conventional farms[148] [149] [150]

[146] No 834/2007 on organic production and labelling of organic products with regard to organic production, labelling and control.

[147] Dicks, L.V., Ashpole, J.E., Dänhardt, J., James, K., Jönsson, A., Randall, N., Showler, D.A., Smith, R.K., Turpie, S., Williams, D.R. & Sutherland, W.J. (2020) Farmland Conservation. Pages 283-321 in: W.J. Sutherland, L.V. Dicks, S.O. Petrovan & R.K. Smith (eds) What Works in Conservation 2020. Open Book Publishers, Cambridge, UK.

[148] Bengtsson J, AhnströmJ, Weibull A-C. (2005). The effects of organic agriculture on biodiversity and abundance: a meta-analysis Journal of Applied Ecology, Vol.42, pp. 261–69

[149] *Tuck SL, WinqvistC, MotaF, AhnströmJ, TurnbullLA, BengtssonJ. (2014) Land-use intensity and the effects of organic farming on biodiversity: a hierarchical meta-analysis. Journal of Applied Ecology, Vol.51, pp.746–55*

[150] *Hole DG, Perkins AJ, Wilson JD, Alexander IH, Grice F, Evans AD (2005). Does organic farming benefit biodiversity? Biol. Conserv. Vol. 122, pp.113–30*

	More evidence • Organic sites had greater biodiversity (34%) than conventional sites. Biodiversity gains increased as average crop field size in the landscape increased, suggesting organic farms provide a "refuge" in intensive landscapes.[151] • Organic farming restored both richness and abundance, including a variety of (dis)service-providing organisms.[152] • Overall organic farming enhances total microbial abundance and activity in agricultural soils at a global scale.[153] • Organic farming promotes diverse arthropod metacommunities that may provide temporal and spatial stability of ecosystem service provisioning[154]. • Organic crops certainly increase the taxonomic richness and abundance of insects as well as the richness of insects within trophic guilds (herbivores, predators, pollinators and parasitoids). Thus, the belief that organic agriculture contributes to the conservation of biodiversity is supported by the analyses

[151] Smith, OM; Cohen, AL; Reganold, JP; Jones, MS; Orpet, RJ; Taylor, JM; Thurman, JH; Cornell, KA; Olsson, RL; Ge, Y; Kennedy, CM; Crowder, DW. 2020

[152] Katayama, N; Bouam, I; Koshida, C; Baba, YG. 2019

[153] Lori, M; Symnaczik, S; Mader, P; De Deyn, G; Gattinger, A. 2017

[154] Lichtenberg, EM; Kennedy, CM; Kremen, C; Batary, P; Berendse, F; Bommarco, et al. 2017

	performed here for the case of insects. An additional and important result that emerged from this study is that both the agrosystem and the surrounding landscape are relevant to the conservation of biodiversity.[155] • Organic farming systems supported on average higher bird numbers (1 to 3 more birds) than conventional systems. However, this positive effect was significant in less than half of the experiments, showing that the uncertainty about the estimated effects is high. Skylarks nesting territories were two times higher in legume and set-aside fields than in other crops during the breeding season[156]. • Total organism abundance and rarefied evenness of a broad range of organisms (arthropods, birds, non-bird vertebrates, plants, soil organisms), significantly increased following implementation of organic farming. Change in richness was not predictive of change in evenness[157]. *Pesticides have a negative impact on biodiversity* Many papers show that insect mass and species have declined over the last decades.

[155] Montañez, MN; Amarillo-Suárez, A. 2014

[156] Wilcox, JC; Barbottin, A; Durant, D; Tichit, M; Makowski, D. 2013

[157] Crowder, DW; Northfield, TD; Gomulkiewicz, R; Snyder, WE. 2012

	Although there are several reasons for the decline in insects, the papers show that intensification of agriculture and the use of pesticides is one of them [158] [159] [160] [161]. A study monitoring 223 substances in European freshwater systems found that single chemicals were likely to exert acute lethal and chronic long-term effects on sensitive fish, invertebrate or algae species. (Malaj et al., 2014, EEA, 2018d). Mixtures of chemicals affect ecosystem integrity in aquatic ecosystems to the extent that simultaneous exposure to pesticides, along with other forms of stress, can render aquatic organisms up to 100 times more vulnerable to pesticides (Liess et al., 2016; Posthuma et al., 2016, Source: EEA, SOER, 2020. The EU projects SOLUTIONS and MARS found that on average 20 % of aquatic species are lost due to exposure to chemical mixtures, with increasing exposure reducing the integrity of aquatic ecosystems (Posthuma et al., 2019)." Source: EEA, SOER, 2020.

[158] Seibold et al. (2019)*:* Arthropod decline in grasslands and forests is associated with landscape-level drivers*. Nature* 574*,* 671–674 *(*2019*)*

[159] D. L. Wagner (2020): Insect declines in the Anthropocene. Annu. Rev. Entomol. 65, 457–480 (2020).

[160] Van Bergen et al (https://esajournals.onlinelibrary.wiley.com/doi/full/10.1890/120126)

[161] David L. Wagner, Eliza M. Grames, Matthew L. Forister, May R. Berenbaum, David Stopak (2021): Insect decline in the Anthropocene: Death by a thousand cuts, Proceedings of the National Academy of Sciences Jan 2021, 118 (2) e2023989118; DOI: 10.1073/pnas.2023989118

1.2 The maximum application rate of plant protection products containing copper compounds is limited to 28 kg/ha of copper over a period of 7 years (i.e., on average 4 kg/ha/year)[162].	Copper is particularly used in organic agriculture and most importantly in horticulture and potatoes production as fungicides and for its antimicrobial properties[163]. However, the use of copper, and notably in its sulphate form, has caused copper (Cu) accumulation in soils and groundwater (Jacobson et al., 2005[164], Komárek et al., 2010[165]. Its negative effects for the environment notably on soil organisms and crop auxiliary species has been recognized and has led to restriction of their use in EU.

Table 4: Criteria for Options A, B and *C (unless otherwise stated)*

Criteria	Rationale
1. Minimising habitat loss or conversion^	
1.1 The activity has not led to the conversion or fragmentation of high-nature-value land, forests, or other lands of high-biodiversity value[166] excluding wetlands, since 2008, or at any future date.	

[162] COMMISSION IMPLEMENTING REGULATION (EU) 2018/ 1981 - of 13 December 2018 - renewing the approval of the active substances copper compounds, as candidates for substitution, in accordance with Regulation (EC) No 1107 / 2009 of the European Parliament and of the Council concerning the placing of plant protection products on the market, and amending the Annex to Commission Implementing Regulation (EU) No 540 / 2011 (europa.eu)

[163] CAN ORGANIC AGRICULTURE GIVE UP COPPER AS A CROP PROTECTION PRODUCT? INRA Andrivon D., Bardin M., Bertrand C., Brun L., Daire X., Fabre F., Gary C., Montarry J., Nicot P., Reignault P., Tamm L., Savini I., 2018. Can organic agriculture give up copper as a crop protection product? Condensed report of the Scientific collective assessment, INRA, 66 p.

[164] Copper accumulation in vineyard soils: Rhizosphere processes and agronomic practices to limit its toxicity January 2015; DOI:10.1007/978-3-319-10969-5_12 Gustavo Brunetto, George Wellington Bastos de Melo, Roberto Terzano, Daniele Del Buono, Stefania Astolfi, Nicola Tomasi, Youry Pii, Tanja Mimmo, Stefano Cesco

[165] Contamination of vineyard soils with fungicides: A review of environmental and toxicological aspects. Michael Komárek, Eva Cadková, Vladislav Chrastný, François Bordas, Jean-Claude Bollinger.

[166] Lands of high-biodiversity-value are specified in Article 29(3) Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources (OJ L 328, 21.12.2018, p. 82)

1.2. The activity has not led and will not lead to the draining, infilling, or other physical damage to wetlands and aquatic habitats, as defined under The Ramsar Convention on Wetlands, encompassing peatlands, floodplains, riparian zones (see below), aquatic (rivers, ponds, springs, etc) and coastal habitats, since 2008 or at any future date. (N.B. It is noted that paludiculture activities is permissible, where evidence is provided that production has not and will not involve drainage of previously undrained soil.) **1.3. No further drainage of moist farm areas is undertaken, such as springs, flushes, water meadows.** **1.4 For operations located in or near to biodiversity-sensitive areas** (including the Natura 2000 network of protected areas, UNESCO World Heritage sites and Key Biodiversity Areas ('KBAs'), as well as national protected areas): 1. Through either conversion or subsequent production since 2008 or going forward, activities do not lead /have not led to the deterioration of natural habitats and the habitats of species and to disturbance of the species for which the protected area have been designated; 2. Land conversion and production activities are carried out in accordance with the conclusions of an appropriate assessment[167], where applicable, and necessary mitigation measures[168] have been implemented accordingly[169]	Drained agricultural land is one of the largest sources of GHG-emissions, but drainage also reduces on farm biodiversity (e.g., loss of waders' habitat) and leads to degradation of adjacent natural habitats such as wetlands and forest.

[167] In accordance with Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (OJ L 20, 26.1.2010, p. 7) and Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (OJ L 206, 22.7.1992, p. 7), or, for activities located in third countries, in accordance with equivalent national provisions or international standards, for example International Finance Corporation (IFC) Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources.

[168] Those measures have been identified to ensure that the project/plan/activity will not have any significant effects on the conservation objectives of the protected area.

[169] Consistent with Statutory Management Requirements 2 and 3 of Regulation (EU) No 1306/2013 and in particular Article 6, paragraphs 1 and 2, of Directive 92/43/EEC and Article 3(1), Article 3(2), point (b), and Article 4, paragraphs 1, 2 and 4 of Directive 2009/147/EC.

1.5 Semi natural grasslands[170] of high biodiversity are not modified through ploughing, seeding, fertilisers, chemicals, mulching etc or converted to other land-use including to build grey infrastructure unless convincing conservation rationale, for example floristic enrichment of impoverished grasslands by the spreading of seeds harvested from biodiverse grasslands	
2. Creation and maintenance of High Biodiversity Landscape Features (HBLFs)^ *Applicable for Options B & C only*	
2.1. The activity maintains non-productive HBLF in at least 10% of its farm area. Specifically: • If the current % is below 10%, then 10% non-productive HBLF is reached within a year. • If the current % is above 10%, then this % is maintained. I.e., Existing HBLFs are not destroyed or converted. **2.2. Management of non-productive HBLFs** **2.2.1. No use of fertiliser, plant protection products or other chemicals within 10m of non-productive HBLFs** **2.2.2. No vegetation cutting / grazing / mowing of non-productive HBLFs during sensitive times of year** such as bird breeding and plant flowering & seed development **2.2.3. No increases in drainage efficiency** such as replacement of drainage ditches with underground pipes. **2.2.4. Invasive alien species are removed within HBLFs to the extent possible without recourse to chemicals**. *Methodological notes:* *Non-productive HBLFs are features primarily for habitat and biodiversity, usually but not always native vegetation based. If a yield is taken, it is incidental and a by-product to the management of the habitat (e.g., hay cut from fallows). Specifically:*	The inclusion of criteria relating to the creation or enhancement of high-biodiversity landscape features is deemed important as agriculture covers c39% of land area in the EU.[171] The EU Biodiversity Strategy requires at least 10% of agricultural area in the EU to be under high-biodiversity landscape features.[172] Many studies converge on 10-14% HBLFs at farm scale as a minimum to avoid crossing critical thresholds of biodiversity loss (Opperman, 2008; Pe'er et al 2020; Biogea, 2020), such as: birds (Traba & Morales, 2019; Walker et al, 2018; Mechtry-Stier et al, 2014 – includes hares; Aebischer & Ewald, 2004), and pollinating and other insects (Humbert et al, 2010; Pfister et al, 2020). Further, inclusion of HBLFs can increase crop yields (Dainese et al 2019 – a global review). Pywell, 2015 shows even modest measures of habitat provision at field edge can increase crop yields (e.g., through buffering field edge conditions) and pay for themselves within a single crop rotation cycle (Pywell, 2015). The share of fallow land in UAA in the EU27 is 4.1% (Eurostat, x), estimated UAA covered by landscape features (Grass margins, shrub margins, single trees bushes, lines of trees,

[170] For grassland definitions, see Table 1.

[171] doi: 10.2785/340432, global: Land Use - Our World in Data based on FAOSTAT 2019

[172] "To provide space for wild animals, plants, pollinators and natural pest regulators, there is an urgent need to bring back at least 10% of agricultural area under high-diversity landscape features. These include, inter alia, buffer strips, rotational or non-rotational fallow land, hedges, non-productive trees, terrace walls, and ponds." Target of the Biodiversity Strategy to 2030.

• *Native vegetation non-productive HBLF: riparian vegetation, native trees (scattered or in groups), non-crop areas within the farm such as buffer strips, field margins with wildflowers or grass, rotational or non-rotational fallow land, hedges, riparian vegetation.* • *Other non-productive HBLF: non-productive trees, terrace walls, stone walls, and ponds.* *The baseline types, extent and condition of the occurring HBLF must be identified in the Biodiversity and Ecosystems impact assessment and surveyed, registered and monitored.* *The HBLF types and locations must be in line with local protection objectives if such exist. The Farm Sustainability Management Plan (FSMP) must explain how national and local priority species and habitats, present or potentially present in the farm, are being supported by the HBLF.* *The FSMP must describe how HBLFs will be created and managed in line with these criteria.*	hedges and ditches) (based on LUCAS survey 2015) is 0.5%. This estimation is to be taken with caution because of methodological caveats. The HBLFs are spatial features but their integrity depends also on management to be made clear in the Farm Management Plan, e.g., from the CAP: GAEC 9 – a ban on cutting hedges and trees during the bird breeding and nesting season, and as an option, measures for avoiding invasive plant species [anything else to add to avoid damage to nesting birds and mammals during key times of the year e.g., field margins & within crop vegetation controls. Both natural and semi-natural habitats are based on communities of native plant species. Their species diversity is often reduced as levels of nutrient deposition increases. This separates, for instance, extensive semi-natural pasture from 'improved pasture'. To retain natural/semi-natural characteristics, these areas should not be fertilised, nor their biota impacted by pesticides, nor their life-cycles impeded by inappropriate management of vegetation in breeding/flowering/seeding times, nor abiotic factors such as hydrological regime altered. Where invasive and non-native species have encroached, to the extent feasible they should be reduced.
2.3. Water courses and bodies have buffer-zones sufficient for conservation of riparian community & prevention of leaching into watercourses. Specifically riparian zones: • Are of native vegetation natural to habitat, managed for biodiversity • Are continuous along water bodies • Cover all stream orders, including ephemeral streams and first order streams. • Have no application of fertilizer and plant protection products in a 10 m vicinity beside surface water bodies[173] • Are at least: • For ditches: buffers = 5m wide • For small / medium rivers and standing water bodies (up to 15m wide): buffers = 10m • For large water bodies, above 15m wide: • buffers = 30m	Riparian buffer zones provide crucial ecosystem services (Riis *et al. (2020).* Global Overview of Ecosystem Services Provided by Riparian Vegetation. Bioscience**.** Small water bodies are vulnerable to changes that have little effect on larger water bodies. For example, they can be affected by small point sources like spray drift of pesticides. Small water bodies are affected by local land management and local scale changes in hydrology. They are also likely to be exceptionally vulnerable to climate change impacts. Small ponds have only a limited ability to dilute and retain pollution, and therefore they are highly susceptible to inputs of even small amounts of pollutants from their surroundings, such as nutrients from agriculture (Kristensen,P. and Globevnik,L. 2014. European small water bodies. Biology and Environment:

[173] Where water bodies are water bodies as defined in the Water Framework Directive

The FSMP must describe how HBLFs will be created and managed in line with these criteria.	Proceedings of the Royal Irish Academy 2014. DOI:10.3318/BIOE.2014.13) **Ditches:** Farm drainage ditches are, analogous to hedges, important for biodiversity connectivity in agricultural landscapes (see Herzon 2008). **5 m** (because we cannot expect 10m on ditches) 5m is the minimum for 'bank stabilisation' in Hawes & Smith, 2005. **6m –** Natural England (2011), recommendation for ditches A 5m grass buffer reduced phosphorous very effectively but 60-90% effective for herbicides. Therefore, can stipulate 5m, but preferably not grass (i.e., woody). **Rivers, streams, ponds & lakes etc less than 15m wide** **10 m** (Brazil Forest Code 2012) Yale (Hawes & Smith, 2005): "For low to moderate slopes, most filtering occurs within the first 10 m, but greater widths are necessary for steeper slopes, buffers comprised of mainly shrubs and trees, where soils have low permeability, or where NPS loads are particularly high." Danish law: Mandatory buffer zones up to 10 meters along all open streams and lakes larger than 100 m2 10m is not excessive, perhaps not enough: The widths of **12 m had an inadequate protection** for the concentration of nutrients used in the study sites (Aguiar, 2015) **15m + water bodies:** Brazil Forest Code 2012 – min. 30m, max 100m – buffer to be half the width of the water body Yale (Hawes & Smith, 2005) (p.8): For water bodies where, surrounding land is more than 15%, **32.5m.** Also**,** 3 Zone system (p.9) = **35m** (bank stabilisation (5m), Trees and shrubs 20m, Grasses & Herbs (10m)). Aguiar (2015): The higher efficiency of **woody vegetation zones** of **36 m** and 60 m widths, combined with agricultural economy, presents a greater potential for acceptance by rural producers, thereby facilitating the diffusion of this conservation practice in agriculture. Furthermore, the width of **36 m** was appropriate to reduce the nitrate concentration to levels below the required values (levels) defined in the water protection legislation and regulatory standards.

3. Soil Management^	
3.1. Avoid burial of organic matter and nutrients to soil depths beyond the major rooting zone **3.2. Avoid fragmentation of soil aggregates resulting in mineralization of organic matter** (flushes of CO2 and NO3-N) e.g., limit tillage and heavy machinery **3.3. Avoid disrupting continuity of natural channels (soil porosity) that allow water and oxygen infiltration and affect soil biodiversity**	Promoting cultivation techniques that reduce the depth and extent of soil disturbance, protect soils. Agricultural soil biodiversity of microorganisms can be improved by reducing perturbation of biotic process. "*Soil biodiversity has diverse and complex impacts on SWR capacity. It is an important supporting factor in enhancing two key parameters of Soil Water Retention (SWR) capacity that are soil structure and soil organic matter. It has first a physical impact on the soil, through the burrowing activity of earthworms, ants and termites but also mammals, which modifies soil structural features at different scales of soil porosity* (Lamandé et al., 2003). *At a macro scale, the burrowing activity creates preferential path flows for water, thus increasing the hydraulic conductivity (Chan, 2001). At a smaller scale, earthworms contribute to the formation of granular aggregates and hence to meso-porosity and micro-porosity, namely through the accumulation of casts below the soil surface (Jongmans et al., 2001 in Bottinelli et al., 2010; Pérès et al., 1998).*[174]
3.4. Prevent soil compaction: frequency and timing of field operations should be planned to avoid traffic on wet soil; tillage operation should be avoided or strongly reduced on wet soils; stock density should be reduced to avoid compaction, especially on wet soils.[175] **3.5 Soil conservation management**: No ploughing on steep slopes >17%, conservation crop rotation ensuring good soil cover, conservation tillage and contour ploughing on slopes with moderate or higher risk of soil erosion >12% and avoiding soil compaction through improved management in order to protect soil fauna	Collectively these measures aim to maintain soil organic matter for biodiversity and address soil structure to prevent soil erosion, increase water retention and reduce water demand Noting that some practices already addressed under 'Nutrient Management to reduce run-off of pollutants to water courses and bodies are also important for Soil Management e.g., cover and intercropping.
4. No direct harm to wildlife^	
4.1 No intentional capture or killing of vertebrate wild animals other than:	Vertebrates as invertebrates dealt with in rules on pesticides.

[174] https://ec.europa.eu/environment/soil/pdf/Soil%20and%20Water.pdf

[175] From 'Taxonomy Report: Technical Annex', EU Technical Expert Group on Sustainable Finance, March 2020. Technical annex to the TEG final report on the EU taxonomy (europa.eu)

• For legally permitted subsistence or recreational hunting (adhering to all laws on target species, methods, season, quota, etc) • Indoor pest control – measures to prevent affecting non-target animals. Only EU permitted chemicals permissible (see Section 8 chemicals below) • Control of invasive alien species or species control as part of a biodiversity conservation plan sanctioned by a competent national authority. **4.2. No intentional killing of species (any taxa) classified by national or international IUCN red lists as 'near threatened' or more severe categories** (e.g., vulnerable, endangered, critically endangered, etc). **4.3. No use of unselective methods** as per EU Habitat Directive Annex 6 **4.4. Limiting barriers to wildlife movement** • Fencing & other barriers (permanent and temporary) should not interrupt movement capabilities of wild animal populations, especially migratory species. • Wildlife connectivity needs to be identified and sufficient measures taken to enable movement (e.g., design of or gaps in fencing, tunnels, bridges, etc). • Fencing can be used to protect from wild predators, in accordance with the above **4.5. Use of non-native species** **4.5.1. Alien species that are considered invasive or high risk are not cultivated** (in Europe, this applies to species of Union concern or on Member States' national lists. Outside Europe, national lists of competent bodies). **4.5.2. Alien species not included in the above-mentioned lists are cultivated only where there is negligible risk of invasion, following a risk assessment process**. **The precautionary principle is employed to prevent the spread of non-native species**. **6.5.3. In case of detection of invasive alien species in the farm area**, the necessary measures are taken based on available scientific evidence, and guidance of competent authorities, and principle that early detection and rapid eradication measures are crucial to prevent the spread of IAS. If eradication is not feasible, containment and control measures should be applied. Management measures should avoid any adverse impact on the environment. *Methodological notes:* *'Invasive alien species' means an alien species whose introduction or spread has been found to threaten or*	The cultivation of alien species complies with the applicable rules regarding the risk, monitoring and safeguards – in Europe, in accordance with Regulation (EU) No 1143/2014 on invasive alien species, of the European Parliament. "Invasive alien species generally cause damage to ecosystems and reduce the resilience of those ecosystems. Therefore, proportionate restoration measures should be undertaken to strengthen the ecosystems' resilience towards invasions" REGULATION (EU) No 1143/2014 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the prevention and management of the introduction and spread of invasive alien species.

adversely impact upon biodiversity and related ecosystem services. *'Early detection' means the confirmation of the presence of a specimen or specimens of an invasive alien species in the environment before it has become widely spread.* *'Eradication' means the complete and permanent removal of a population of invasive alien species by lethal or nonlethal means.* *'Containment' means any action aimed at creating barriers which minimises the risk of a population of an invasive alien species dispersing and spreading beyond the invaded area.*	
5. Diversified crop rotation	
5.1 A crop rotation system is in place on arable land for at least five different crops. **5.2. The highest share of any cash crop should be below 33%.** **5.3 Legumes and mixtures with legumes are grown on at least 10% of the farm UAA** (including legume intercropping)[176]. **5.4. For the main crop there is an annual obligatory crop rotation on the same plot**. The main crops need to belong to different botanical families. **5.5. Farms with permanent crop (where crop rotation is not applicable) have at least five different crops in the area of the farm or in case perennial crops combining agroforestry or orchard with other herbaceous and woody plant (soft fruit, aromatic plants, etc) to increase resilience system[177];** Or implement crop rotation of at least 2 crops including at least one legume[178]. This can be implemented via intercropping or spatially distinct parcels	Many papers shows that crop rotation as a sustainable farming practice ensures soil regeneration and fertility conditions and can favour biodiversity on soil, fauna above soil and plant biodiversity[179]. Soil biodiversity benefits from soil rotations when Sustainable practices applied. "Conservation tillage and crop rotations with legume support diversity of soil microbial communities (Lupway et al., 1998)"[180]

[176] Intercropping legume and non-legume, an innovative way to valorize N2 fixation and soil mineral sources in low inputs cropping systems. (inrae.fr)

[177] Apple farming systems – Current initiatives and some prospective views on how to improve sustainability. Pierre-Eric Lauri, Benjamin Pitchers, Lydie Dufour, Sylvaine Simon; https://hal.inrae.fr/hal-02737792/file/Lauri%20et%20al_Sustainable%20management%20of%20apple%20cultivation_DEF_1.pdf

[178] DURUM WHEAT IN OLIVE ORCHARD: MORE INCOME FOR THE FARMERS? Panozzo A, Desclaux D; Durum wheat in olive orchard: more income for the farmers? (inrae.fr)

[179] BIO_crop_rotations_final final report_rev executive summary comments AGRI_ENV_BIO (europa.eu)

[180] BIO_crop_rotations_final final report_rev executive summary comments AGRI_ENV_BIO (europa.eu)

of different crops, can be also combined with crop rotation in arable land.	

Supplementary Material: Additional criteria for DNSH to Pollution Prevention and Control

In order to achieve a sustainable farm nitrogen surplus limit and to minimize unnecessary losses of nutrients, compliance with the following agricultural management practices is essential. The proposed measures have been proven to reduce emissions to the air of ammonia (NH3), nitrogen oxides (NOx), nitrous oxide (N2O) and N2, plus nitrate ($NO3^-$) and other Nr leaching to water and total N loss[181]. They are part of many fertilization legislations in the EU implementing the Nitrate Directive.

These criteria have been developed based on recommendations published by international scientific expert panels, UN governing bodies and the EU-KOM:

- the *Guidance document on integrated sustainable nitrogen management* which has been originally developed by the Task Force on Reactive Nitrogen (TFRN) under the Working Group on Strategies and Review of the UNECE Convention on Long-range Transboundary Air Pollution[182] and is now adopted by the UNECE Executive Body for the Convention on Long-range Transboundary Air Pollution[183],

[181] e.g., Markus Hoffmann and Holger Johnsson (2000) "Nitrogen Leaching from Agricultural Land in Sweden," AMBIO: A Journal of the Human Environment 29(2), 67-73.

[182] http://www.clrtap-tfrn.org/

[183] United Nations, Economic and Social Council, Executive Body for the Convention on Long-range Transboundary Air Pollution (2021): Guidance document on integrated sustainable nitrogen management, https://unece.org/environment/documents/2021/04/working-documents/guidance-document-integrated-sustainable-nitrogen

- the HELCOM[184] document *Revised Palette of measures for reducing phosphorus and nitrogen losses from agriculture*[185],
- The draft delegated act of the Taxonomy to climate mitigation[186],
- the *Recommendations for establishing Action Programmes under Directive 91/676/EEC* developed by a consortium led by Wageningen University[187],
- the EU-Nitrative directive[188].

Criteria	Rationale
1. The soil is covered with plants (crops that are sown before winter or cover and catch crops[189]) In regions with a break in the growing season (autumn/winter). Where this is not possible or relevant, leaving stubble or allowing natural volunteer crop/vegetation regrowth is allowed. For	Nitrate originating from post-harvest decomposition and mineralisation is taken up by catch crops between the main cropping season. This measure prevents nitrogen leaching from bare soils. Plant cover in winter can reduce erosion 10-40% and nitrate leaching 10-70%[193].

[184] HELCOM is the governing body of the "Convention on the Protection of the Marine Environment of the Baltic Sea Area", https://helcom.fi

[185] Baltic Marine Environment Protection Commission (2013): Revised Palette of measures for reducing phosphorus and nitrogen losses from agriculture, https://helcom.fi/media/documents/Revised-palette-of-agri-environment-measures.pdf

[186] EU-COM (2020) – Draft ANNEX to the Commission Delegated Regulation supplementing Regulation (EU) 2020/852 – climate mitigation.

[187] Recommendations for establishing Action Programmes under Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources (ND-Act). Alterra, Wageningen-UR, Wageningen.

[188] Council Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources (the Nitrates Directive) (https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1561542776070&uri=CELEX:01991L0676-20081211)

[189] A catch crop is a crop grown in the space between two main crops or at a time when no main crops are being grown.

[193] TFRN (2021) Landscape measure 2; Helcom (2013), p.1 and 3, Nitrate Directive (1991) ANNEX II, B

example, in vineyards[190] as well as in dry areas where the cover can influence the water storage into the soil matrix[191];[192]. An exception is possible when the farmer can prove that soil preparation is only possible shortly before the growing season (e.g., clay soils in Nordic countries).	
2. The holding implements a yearly crop nutrient management and fertilisation plan, established with the help of guidelines certified by national or regional bodies or with standards developed by the EU or other official bodies. I. The plan considers field cropping and yield history, crop residues, soil nutrient level[194], nutrient providing capacity, planned crop yields on expected variety capacity and plant/seed capacity, based on the previous crop rotation cycle or other appropriate time	A nutrient management and fertilisation plan supports the integration of all the nutrient requirements of arable and forage crops on the farm and helps to optimize nutrient use efficiency and through that and reduce losses of nutrients to air and water and therefore benefitting both the environment and the crop production economy[201]. Humus, as stabilised organic matter, is the result of the transformation of organic matter incorporated into the soil. The humification process into stable humus contributes mainly in maintaining sol physical structure[202]. According to various development in soil science and ecosystems (Bardgett et al., 1998; Ponge et al., 1998; Schwartz et al.,

[190] Spontaneous cover-crop characterization is relevant to define a sustainable soil management strategy in vineyard - Institut National de Recherche en Agriculture, Alimentation et Environnement (inrae.fr) Aurelie Metay Eve Durocher Léo Garcia Guillaume Fried Jean Richarte Benedicte Ohl Yvan Bouisson Clément Enard Raphaël Metral Christian Gary Elena Kazakou.

[191] Ziegler and Giambelluca, 1998; Wainwright et al., 2002f

[192] Soil-erosion and runoff prevention by plant covers. A review (archives-ouvertes.fr) Víctor Hugo Durán Zuazo, Carmen Rocío Rodríguez Pleguezuelo

[194] For example, impact of farmyard manure on soil nutrients may extend over various years depending on various soil properties (e.g., Ph, soil physical properties), because of slower decomposition and nutrient release.

[201] TFRN (2021), field measure 1; Helcom (2013), p.4, Nitrate Directive (1991) ANNEX II, B

[202] Oades, J. M. (1984). "Soil organic matter and structural stability: Mechanisms and implications for management". *Plant and Soil*. **76** (1–3): 319–337

frame for perennial crops but at least for three years. II. Fertilizer applications and nutrient content of the fertilizers (at least N and P) are documented in detail. III. The pH-value of the soil is periodically determined as part of soil testing (every 3 to 5 years) and documented. The value must lie in an optimal range (6.5 to 7)[195] [196], or below in case of paludiculture on wetland. IV. The soil is systematically and periodically tested for nutrients (every 3-5 years for N, every 5 years for P) and for structure and physical properties (all three years). Results are documented. The testing is conducted with a reliable method. A reliable method follows state-of-the-art methodologies and best practices examples: i.e., Soil Sampling Protocol from European Soil Data Center (ESDAC)[197] (Map of pH in Europe JRC. Soil pH in Europe 2010[198]) or the soil testing methods published by the FAO[199]. (i.e., humus quality and annual humus balance, calculated as an area-weighted	2000; Hooper et al., 2000; Lavelle, 2000; Landeweert et al., 2001; Klironomos and Hart, 2001) humus forms may be key in the functional biodiversity of terrestrial ecosystems[203]. Negative humus balance is an indicator of long-term risk of soil fertility loss as well as in fluctuations in soil acidity. The soil pH has to be monitored because some agricultural practices, mainly application of ammonium-based fertilisers and urea, and elemental S fertilizer can lead to acidification. Nutrient bioavailability decreases below crop specific critical pH values so it influences nutrient management in the cropping system. In addition, soil PH analysis determine the optimal range for both acidic and alkaline soils, for nutrients uptake efficiency and avoiding immobilisation and increases uptake of heavy metals toxic for the crop (e.g., Fe, Zn, Cu, Pb and Mn, Pb, Cd, Hg). The pH

[195] Best environmental management practices, sector environmental performance indicators and benchmarks of excellence for the agriculture sector under Regulation (EC) No 1221/2009 EUR-Lex - 02018D0813-20180608 - EN - EUR-Lex (europa.eu)

[196] http://www.fao.org/3/X5648E/x5648e0e.htm

[197] https://esdac.jrc.ec.europa.eu/themes/soil-sampling-protocol

[198] https://esdac.jrc.ec.europa.eu/content/soil-ph-europe

[199] Soil testing methods – Global Soil Doctors Programme - A farmer-to-farmer training programme. Rome. https://doi.org/10.4060/ca2796en

[203] Humus forms in terrestrial ecosystems: a framework to biodiversity (archives-ouvertes.fr) Jean-François Ponge;

average of all areas) must be determined with a humus inspection every six years. The humus balance must never be negative and must follow a conventional approach such as the AMG model[200]. The farmer can prove that he has either outsourced the inspection to an expert or done it himself in a correct way.	influences the ionic form in which the element is present in the soil[204].
3. The holding limits the periods when fertilisers (organic and mineral) are applied on land to target application to periods when an actively growing crop requires nitrogen and take into account the climatic and soil condition. Fertilizer applications are therefore technically optimized and timed to coincide as closely as possible to the period of optimal crop uptake. So, no fertilizer can	Applying fertilizers with a substantial N-content to the soil at times when it is not required by an actively growing crop risks the loss of a substantial proportion of the applied nitrogen to water or air[205] [206] [207](e.g., *A Swedish study has shown: Leaching decreased as expected when manure was applied in spring instead of in autumn. The decrease varied from 5% to about 50%*[208]).

[200] Named from its authors: A. Andriulo, B. Mary and J. Guérif; references: Mary and Guérif, 1994; Andriulo et al, 1999).

[204] Influence of the soil pH in the uptake and bioaccumulation of heavy metals (Fe, Zn, Cu, Pb and Mn) and other elements (Ca, K, Al, Sr and Ba) in vine leaves, Castilla-La Mancha (Spain) S.Bravoab; J.A.Amorós; C.Pérez-de-los-Reyes; F.J.García; M.M.Moreno; M.Sánchez-Ormeño; P.Higueras. https://doi.org/10.1016/j.gexplo.2015.12.012)

[205] *TFRN (2021), Field measure 3; Helcom (2013), p. 7, Nitrate Directive (1991), ANNEX II, A*

[206] P.W. Wadman and J.J. Neeteson. 1992. Nitrate leaching losses from organic manures —the Dutch experience. Archer J.R., Goulding K.W.T., Jarvis S.C., Knott C.M., Lord E., Ogilvy S.E., Orson J., Smith K.A., Wilson B., (eds.). In: *Aspects of Applied Biology* 30:117–126

[207] K.A. Smith and B.J. Chambers 1992. Improved utilisation of slurry nitrogen for arable cropping. Archer J.R., Goulding K.W.T., Jarvis S.C., Knott C.M., Lord E., Ogilvy S.E., Orson J., Smith K.A., Wilson B., (eds.). In: *Aspects of Applied Biology* 30:127–134.

[208] Markus Hoffmann and Holger Johnsson (2000) "Nitrogen Leaching from Agricultural Land in Sweden," *AMBIO: A Journal of the Human Environment* 29(2), 67-73.

be applied earlier than 1 month before the start of the growing season. Periods of high rainfall are avoided (unexpected extreme weather events excluded).	
4. Spreading manure and other organic material is not allowed when the soil is flooded, water saturated, frozen on snow covered ground or on steeply sloping ground. For liquid manure the slope limit for spreading is 6%, for all other 12%.	Avoiding the spread of mineral fertilisers or manure and other organic material during high-risk periods reduces the availability of nitrate for loss through leaching in surface runoff. High-risk periods are, when there is a high risk of surface flow or rapid movement to field drains from wet soils[209].
5. Livestock slurry and digestates must be incorporated into the soil by using application techniques reducing ammonia emissions such as trailing hose or trailing shoe or injection.	Reducing the overall surface area of slurry, by using trailing hose, shoe or injection of slurry will lead to a reduction in ammonia emissions compared with surface broadcast application[210].
6. If for the application of manure trailing hose or trailing shoe are used, the slurry is incorporated into the soil as soon as possible and at least within 1 hour.	The rapid soil incorporation of applied manure reduces the exposed surface area of manure and can therefore reduce N losses in run-off[211].
7. Fertilizer application is not allowed in a 10 m vicinity beside surface water bodies (where water bodies are water bodies as defined in the Water Framework Directive).	*"Application of fertilizers and manures near watercourses causes risk of direct application of fertilizer and manures into surface waters. … Moreover, the indirect discharge of fertilizer and manure nutrients into surface waters through surface runoff and leaching may be also significant, especially on sloping grounds, and soils with*

[209] *TFRN (2021), Field measure 3 and Field measure 5.; Helcom (2013), p.7, Nitrate Directive (1991), ANNEX II, A*

[210] *TFRN (2021), Field measure 6 (trailing hose and shoe), Field measure 7 (slurry injection); Helcom (2013), p. 6, Nitrate Directive (1991), ANNEX II, A*

[211] *TFRN (2021), Field measure 11*

	very low infiltration capacity or permeable soils. Unfertilized buffer strips can be highly effective in this case. Unfertilised buffer strips further contribute to water protection through an increased residence time of nutrients in the field as a whole, thus increasing the probability of denitrification (for N) and retention in soil (for P). If vegetated, strips can also act as effective interceptors of the nutrients passing by"[212]. Not applying mineral or organic fertilisers at any time to water bodies directly bordering surface waters helps to prevent the mobilisation and transfer of nitrate to the watercourses[213].
8. No fertilization within 10m of High Biodiversity Landscape Features (HBLFs)[214]	

[212] Recommendations for establishing Action Programmes under Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources (ND-Act). Alterra, Wageningen-UR, Wageningen.

[213] *TFRN (2021), Field measure 5; Helcom (2013), p. 7, Very Good Agricultural Practice, Guideline on Livestock Production - www.food-biodiversity.eu, p.11*

[214] *HBLFs are features primarily for habitat and biodiversity, usually but not always native vegetation based. If a yield is taken, it is incidental and a by-product to the management of the habitat (e.g., hay cut from fallows). Specifically:*

- *Native vegetation non-productive HBLF: riparian vegetation, native trees (scattered or in groups), non-crop areas within the farm such as buffer strips, field margins with wildflowers or grass, rotational or non-rotational fallow land, hedges, riparian vegetation.*
- *Other non-productive HBLF: non-productive trees, terrace walls, stone walls, and ponds.*

1.3 Forestry logging

Description of the activity

These criteria cover the production of timber and related forestry operations.

In accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006, these activities are classified under NACE codes 2.1 and 2.2:

A.02.1 - Silviculture and other forestry activities:

Includes: growing of standing timber (planting, replanting, transplanting, thinning and conserving of forests and timber tracts), growing of coppice, pulpwood and firewood, operation of forest tree nurseries. These activities can be carried out in natural or planted forests.

Excludes: growing of Christmas trees, operation of tree nurseries (except for forest trees), collection of wild mushrooms, other non-wood forest products, production of wood chips and particles

A.02.2 – Logging:

Includes production of roundwood for forest-based manufacturing industries or used in an unprocessed form such as pit-props, fence posts and utility poles, gathering and production of wood for energy, gathering and production of forest harvesting residues for energy, production of charcoal in the forest (using traditional methods). The output of this activity can take the form of logs or firewood.

Excludes: growing of Christmas trees, production of wood chips and particles, production of charcoal through distillation of wood.

NACE codes A.02.30 (Gathering of wild growing non-wood products) and A.02.40 (Support services to forestry) are *not* covered by these criteria.

These criteria apply to lands classified as forests and 'other wooded land' (OWL) (see below). They do not apply to small scale tree management in urban landscapes and agricultural lands.

The FAO (2020)[215] defines forest as "*Land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent, or trees able to reach these thresholds in situ. It does not include land that is predominantly under agricultural or urban land use."*

"Other wooded land" (OWL) is defined as "of more than 0.5 hectares with a canopy cover of 5-10 % of trees able to reach a height of 5 metres in situ; or a canopy cover of more than 10 % when smaller trees, shrubs and bushes are included.

Explanatory notes

1. Forest is determined both by the presence of trees and the absence of other predominant land uses. The trees should be able to reach a minimum height of 5 meters in situ.

2. Includes areas with young trees that have not yet reached but which are expected to reach a canopy cover of 5-10 percent and tree height of 5 meters (see above forest definitions). It also includes areas that are temporarily unstocked due to clear-cutting as part of a forest management practice, natural disasters or other human induced disturbance and which are expected to be regenerated within 5 years. Local conditions may, in exceptional cases, justify that a longer time frame is used.

3. Includes forest roads, firebreaks and other small open areas; forest in national parks, nature reserves and other protected areas such as those of specific environmental, scientific, historical, cultural or spiritual interest.

4. Includes windbreaks, shelterbelts and corridors of trees with an area of more than 0.5 hectares and width of more than 20 meters.

5. Includes abandoned shifting cultivation land with a regeneration of trees that have, or are expected to reach, a canopy cover of 10 percent and tree height of 5 meters.

6. Includes areas with mangroves in tidal zones, regardless of whether this area is classified as land area or not.

7. Includes rubber-wood and cork oak plantations, cork forest, and cork oak savannah (dehesa & montado) and other agroforestry systems where crops are grown or livestock reared under

[215] i8661en.pdf (fao.org)

tree cover. Some agroforestry systems such as the "Taungya" system where crops are grown only during the first years of the forest rotation should be classified as forest.

8. Includes areas with bamboo and palms if land use, height and canopy cover criteria are met.

9. Includes areas outside the legally designated forest land which meet the definition of "forest".

10. Excludes tree stands in agricultural production systems, such as fruit tree plantations, oil palm plantations, olive orchards and Christmas trees.

These criteria are applicable to forestry and logging activities with integrated conservation and restoration as captured in the criteria below. A forestry or logging operator can alternatively use the criteria under 'Conservation of Habitats and Ecosystems' and / or 'Restoration of Habitats and Ecosystems' to assess conservation or restoration activity that can be separately distinguished from any timber production activity.

Substantial contribution to the Protection and restoration of biodiversity and ecosystems
If the activity and associated Forest Management Unit (FMU) is being newly established (i.e., afforestation), the area on which the activity will take place is covered by an afforestation plan (AP) or equivalent of a duration of at least five years, or the minimum period prescribed in national law, developed prior to the start of the activity and continuously updated, until this area matches the definition of forest as given above.[216] After that time, or for forests not newly established, the area on which the activity takes place is covered by a forest management plan (FMP) or equivalent of a duration of at least ten years[217], or the minimum period prescribed in national law, and is updated continuously. The AP and FMP include a biodiversity assessment of the site in the context of national and local conservation priorities, setting out how it will contribute significantly to those,

[216] This follows the wording of the TSC for Climate Change Mitigation per ANNEX 1 to the Commission Delegated Regulation (EU) .../...

[217] This requirement is consistent with the Forestry TSC for Climate Change Mitigation in ANNEX 1 to the Commission Delegated Regulation (EU) .../...

safeguarding conditions of any priority habitats and species present, etc. It provides detailed spatial and temporal information to describe how the criteria described in Table 1 are met.

All criteria in Table 1 must be met unless otherwise stated in Table 1 or where particular practices can be demonstrated to be not applicable to that holding.

The AP and FMP will provide for monitoring that ensures the correctness of the information contained in those plans.

Within two years after the beginning of the activity and every 10 years thereafter, the compliance of the activity with these practices are verified by either the relevant national competent authorities or an independent third-party certifier.[218]

Compliance with the essential practices may be checked:

(a) at the level of the forest sourcing area[219]

(b) at the level of a group of holdings sufficiently homogeneous to evaluate the risk of the sustainability of the forest activity, provided that all those holdings have a durable relationship between them and participate in the activity and the group of those holdings remains the same for all subsequent audits.

Do no significant harm ('DNSH')

[218] Wording taken from the Forestry TSC for SC to Climate Change Mitigation in ANNEX 1 to the Commission Delegated Regulation (EU) .../...

[219] "Sourcing area" as it is defined in Article 2, point (30), of Directive (EU) 2018/2001; 'Sourcing area' means the geographically defined area from which the forest biomass feedstock is sourced, from which reliable and independent information is available and where conditions are sufficiently homogeneous to evaluate the risk of the sustainability and legality characteristics of the forest biomass.

(1) Climate change mitigation	For afforestation only[220] 1. Afforestation plan and subsequent forest management plan or equivalent instrument 1.1. The area on which the activity takes place is covered by an afforestation plan of a duration of at least five years, or the minimum period prescribed in national law, developed prior to the start of the activity, and continuously updated until this area matches the definition of forest as set out in national law or where not available, is in line with the FAO definition of forest. The afforestation plan contains all elements required by the national law relating to environmental impact assessment of afforestation. 1.2. Preferably through the afforestation plan, or if information is missing, through any other document, detailed information is provided on the following points: (a) description of the area according to its gazetting in the land registry; (b) site preparation and its impacts on pre-existing carbon stocks, including soils and above-ground biomass, in order to protect land with high carbon stock[221]; (c) management goals, including major constraints; (d) general strategies and activities planned to reach the management goals, including expected operations over the whole forest cycle;

[220] As defined in ANNEX 1 to the Commission Delegated Regulation (EU) .../...

[221] Land with high-carbon stock means wetlands, including peatland, and continuously forested areas within the meaning of Article 29(4)(a), (b) and (c) of Directive (EU) 2018/2001.

	(e) definition of the forest habitat context, including main existing and intended forest tree species, and their extent and distribution; (f) compartments, roads, rights of way and other public access, physical features including waterways, areas under legal and other restrictions; (g) measures deployed to establish and maintain the good condition of forest ecosystems; (h) consideration of societal issues (including preservation of landscape, consultation of stakeholders in accordance with the terms and conditions laid down in national law); (i) assessment of forest related risks, including forest fires, and pests and diseases outbreaks, with the aim of preventing, reducing and controlling the risks and measures deployed to ensure protection and adaptation against residual risks; (j) assessment of impact on food security; (k) all DNSH criteria relevant to afforestation 1.3. When the area becomes a forest, the area is subject to a forest management plan or an equivalent instrument, as set out in national law or, where national law does not define a forest management plan or equivalent instrument, as referred to in the FAO definition of 'forest area with long-term forest management plan'222. The forest management plan or the equivalent instrument covers a period of 10 years or more and is continuously updated.

[222] Forest area that has a long-term (ten years or more) documented management plan, aiming at defined management goals, and which is periodically revised, FAO Global Resources Assessment 2020. Terms and definitions (version of [adoption date]: http://www.fao.org/3/I8661EN/i8661en.pdf).

	1.4. Information is provided on the following points that are not already documented in the forest management plan or equivalent system: (a) management goals, including major constraints[223]; (b) general strategies and activities planned to reach the management goals, including expected operations over the whole forest cycle; (c) definition of the forest habitat context, including main existing and intended forest tree species, and their extent and distribution; (d) definition of the area according to its gazetting in the land registry; (e) compartments, roads, rights of way and other public access, physical features including waterways, areas under legal and other restrictions; (f) measures deployed to maintain the good condition of forest ecosystems; (g) consideration of societal issues (including preservation of landscape, consultation of stakeholders in accordance with the terms and conditions laid down in national law); (h) assessment of forest related risks, including forest fires, and pests and diseases outbreaks, with the aim of preventing, reducing and controlling the risks and measures deployed to ensure protection and adaptation against residual risks (i) all DNSH criteria relevant to forest management.

[223] Including an analysis of (i) long term sustainability of the wood resource and (ii) impacts/pressures on habitat conservation, diversity of associated habitats and condition of harvesting minimizing soil impacts.

	1.5. The activity follows the best afforestation practices laid down in national law, or, where no such best afforestation practices have been laid down in national law, the activity complies with one of the following criteria: (a) the activity complies with Delegated Regulation (EU) No 807/2014; (b) the activity follows the "Pan-European Guidelines for Afforestation and Reforestation with a special focus on the provisions of the UNFCCC"[224]. For all other forestry activity except afforestation[225] 1. Forest management plan or equivalent instrument 1.1. The activity takes place on area that is subject to a forest management plan or an equivalent instrument, as set out in national law or, where national regulation does not define a forest management plan, as referred to in the FAO definition of 'forest area with long-term forest management plan'226. The forest management plan or the equivalent instrument covers a period of 10 years or more and is continuously updated. 1.2. Information is provided on the following points that are not already documented in the forest management plan or equivalent system:

[224] Forest Europe Pan-European Guidelines for Afforestation and Reforestation with a special focus on the provisions of the UNFCCC adopted by the MCPFE Expert Level Meeting on 12-13 November, 2008 and by the PEBLDS Bureau on behalf of the PEBLDS Council on 4 November, 2008 (version of [adoption date]: https://www.foresteurope.org/docs/other_meetings/2008/Geneva/Guidelines_Aff_Ref_ADOPTED.pdf).

[225] As defined in ANNEX 1 to the Commission Delegated Regulation (EU) .../...

[226] Forest area that has a long-term (ten years or more) documented management plan, aiming at defined management goals, and which is periodically revised. FAO Global Resources Assessment 2020. Terms and definitions (version of [adoption date]: http://www.fao.org/3/I8661EN/i8661en.pdf).

	(a) management goals, including major constraints; (b) general strategies and activities planned to reach the management goals, including expected operations over the whole forest cycle; (c) definition of the forest habitat context, main forest tree species and those intended and their extent and distribution, in accordance to the local forest ecosystem context; (d) definition of the area according to its gazetting in the land registry; (e) compartments, roads, rights of way and other public access, physical features including waterways, areas under legal and other restrictions; (f) measures deployed to maintain the good condition of forest ecosystems; (g) consideration of societal issues (including preservation of landscape, consultation of stakeholders in accordance with the terms and conditions laid down in national law); (h) assessment of forest related risks, including forest fires, and pests and diseases outbreaks, with the aim of preventing, reducing and controlling the risks and measures deployed to ensure protection and adaptation against residual risks; (i) all DNSH relevant to forest management. 1.3. The sustainability of the forest management systems, as documented in the plan referred to in point 1.1, is ensured by choosing the most ambitious of the following approaches: (a) the forest management matches the applicable national definition of sustainable forest management;

	(b) the forest management matches the Forest Europe definition[227] of sustainable forest management and complies with the PanEuropean Operational Level Guidelines for Sustainable Forest Management[228]; (c) the management system in place complies with the forest sustainability criteria laid down in Article 29(6) of Directive (EU) 2018/2001, and as of the date of its application with the implementing act on operational guidance for energy from forest biomass adopted under Article 29(8) of that Directive. <u>For all forestry activities:</u> 1.6. The activity does not involve the degradation of land with high carbon stock[229]. 1.7. The management system associated with the activity in place complies with the due diligence obligation and legality requirements laid down in Regulation (EU) No 995/2010. 1.8. The afforestation plan (if relevant) and the (subsequent) forest management plan or equivalent instrument provides for monitoring that

[227] The stewardship and use of forests and forest lands in a way, and at a rate, that maintains their biodiversity, productivity, regeneration capacity, vitality and their potential to fulfil, now and in the future, relevant ecological, econom The stewardship and use of forests and forest lands in a way, and at a rate, that maintains their biodiversity, productivity, regeneration capacity, vitality and their potential to fulfil, now and in the future, relevant ecological, economic and social functions, at local, national, and global levels, and that does not cause damage to other ecosystems.

[228] Annex 2 of the Resolution L2. Pan-European Operational Level Guidelines for Sustainable Forest Management. Third Ministerial Conference on the Protection of Forests in Europe 2-4 June 1998, Lisbon/Portugal (version of [adoption date]: https://foresteurope.org/wp-content/uploads/2016/10/MC_lisbon_resolutionL2_with_annexes.pdf#page=18)

[229] Land with high-carbon stock means wetlands, including peatland, and continuously forested areas within the meaning of Article 29(4)(a), (b) and (c) of Directive (EU) 2018/2001.

	ensures the correctness of the information contained in the plan, in particular as regards the data relating to the involved area. The Forest Management Plan identifies the management practices or other measures that ensure compliance with these criteria. The same requirements for audit and provisions for group assessment apply as for the Technical Screening Criteria to Mitigation.
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.
(3) Sustainable use and protection of water and marine resources	DNSH as set out in Appending B of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852. The Forest Management Plan identifies the management practices or other measures that ensure compliance with these criteria
(4) Transition to a Circular Economy	N/A
(5) Pollution prevention and control	• For conservation forestry[230]. The activity does not use pesticides or fertilisers. Alternatively, for all other forestry activities: The use of pesticides is reduced and alternative approaches or techniques, which may include non-chemical alternatives to pesticides, are favoured, in accordance with Directive 2009/128/EC of the European Parliament and of the Council[231], with exception of occasions where

[230] As defined in ANNEX 1 to the Commission Delegated Regulation (EU) .../...

[231] Directive 2009/128/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for Community action to achieve the sustainable use of pesticides (OJ L 309, 24.11.2009, p. 71).

	the use of pesticides is needed to control outbreaks of pests and of diseases. • The activity minimizes the use of fertilisers and does not use manure. The activity complies with Regulation (EU) 2019/1009 of the European Parliament and of the Council[232] or national rules on fertilisers or soil improvers for agricultural use. • Well documented and verifiable measures are taken to avoid the use of active ingredients that are listed in Annex I, part A, of Regulation (EU) 2019/1021[233] of the European Parliament and of the Council[234], the Rotterdam Convention on the prior informed consent procedure for certain hazardous chemicals and pesticides in international trade[235], the Minamata Convention on Mercury[236], the Montreal Protocol on Substances that Deplete the Ozone Layer[237], and of active ingredients that are listed as classification Ia ('extremely hazardous') or Ib ('highly hazardous') in the WHO Recommended

[232] Regulation (EU) 2019/1009 of the European Parliament and of the Council of 5 June 2019 laying down rules on the making available on the market of EU fertilising products and amending Regulations (EC) No 1069/2009 and (EC) No 1107/2009 and repealing Regulation (EC) No 2003/2003 (OJ L 170, 25.6.2019, p. 1).

[233] Which implements in the Union the Stockholm Convention on persistent organic pollutants (OJ L 209, 31.7.2006, p. 3.).

[234] Regulation (EU) 2019/1021 of the European Parliament and of the Council of 20 June 2019 on persistent organic pollutants (OJ L 169, 25.6.2019, p. 45).

[235] Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (OJ L 63, 6.3.2003, p. 29).

[236] Minamata Convention on Mercury (OJ L 142, 2.6.2017, p. 6.).

[237] Montreal Protocol on Substances that Deplete the Ozone Layer (OJ L 297, 31.10.1988, p. 21)

	Classification of Pesticides by Hazard[238]. The activity complies with the relevant national law on active ingredients. • Pollution of water and soil is prevented and cleaning up measures are undertaken when pollution occurs. The Forest Management Plan identifies the management practices or other measures that ensure compliance with these criteria.

Rationale

The scope of activities selected

The forestry activities according to the NACE codes listed above are addressed here under one set of criteria for 'forestry and logging' due to significant commonality in the criteria required. The intention is to address the economic activity through its full lifecycle, from planting to management (including tending, thinning, logging) over the forest's rotation cycle, and including any initial land conversion. Hence it incorporates both Afforestation and Forest Management, listed as two separate activities in the 'Mitigation Taxonomy and Adaptation Taxonomy' per the draft released in April 2021, and expands this to also address logging.

NACE codes A.02.30 (Gathering of wild growing non-wood products) and A.02.40 (Support services to forestry) are *not* covered by these criteria due to time constraints but are recommended to be addressed in a subsequent round of criteria development.

Production of Christmas trees are excluded as they more usually resemble agricultural production than forestry (and rarely exceed 5m in height), so will be more likely to qualify for significant contribution through criteria on crops. Were Christmas trees to be produced within a wider forestry system, that system would be covered by these criteria.

How forestry and logging impacts on biodiversity and ecosystems

[238] The WHO Recommended Classification of Pesticides by Hazard (version 2019), (version of [adoption date]: https://apps.who.int/iris/bitstream/handle/10665/332193/9789240005662-eng.pdf?ua=1).

Forestry and logging is a hugely important sector when considering the objective of the protection and restoration of biodiversity and ecosystems.

Globally, forests host about 80% of the world's biodiversity. They also provide many other crucial ecosystem services, from climate and hydrological regulation to provision of clean air, to regulating the prevalence of zoonotic diseases that can switch to humans (WWF, 2020). Ecosystem services of forests have long been valued in the trillions of dollars per annum[8].

Forest loss and degradation are the greatest threats to biodiversity worldwide (Betts et al 2021). Outright forest clearance is the greatest single threat (Maxwell et al., 2016) and "forest degradation from logging is the most pervasive threat facing species inhabiting intact forest". (Watson et al, 2018). Logging at commercial intensities reduces a wide range of environmental values by damaging "forest characteristics including physical structure, species composition, diversity, abundance and functional organisation compared with their natural state" (ibid). The multifunctional attributes of forests are not resilient to intensive forestry (Thompson et al, 2011; Pohjanmies et al, 2021).

Globally, a third of pre-industrial forest has been cleared and 82% of the remainder is degraded. 70% of world's forests are within 1 km of a forest edge (and rising) (see Watson et al., 2018 & Haddad et al 2015).

Within Europe, forests are the largest terrestrial ecosystem, covering around 40% of the territory. 85% of this forest land is available for wood supply[239]. But although Europe's forests having been subject to much modification, they remain "one of the ecosystems in Europe with the highest degree of biodiversity.

Nonetheless, there are concerns over the degradation of forest biodiversity within and outside Europe" (EEA 2016). European forest biodiversity is plummeting - both within and outside Natura 2000 sites (IUCN, 2019). Forests make up almost half the area of Annex 1[16] Natura 2000 sites: only 15% are in 'favourable condition', the vast majority in poor condition (26% "unfavourable-bad', and 54% unfavourable-inadequate). Of Red-List forest species, 2-7% are already extinct, 15% are critically endangered, 40% (especially birds and plants) endangered, etc. (see EEA 2016).

[239] Forest Europe 2020, FISE

The forestry sector is the principal pressure on quality of European forest habitats due to removal of dead & dying trees, clear cutting, removal of deadwood, removal of old trees, conversion into monoculture plantations, hydrological changes, and replacement with non-native or invasive species (EEA, 2020). To meet the EU Biodiversity's Strategy's aspiration that, 'from today the world's biodiversity needs to be put on the path to recovery'[240], huge improvements are needed. However, the green taxonomy is in a position to catalyse progress, building on consensus that 'sustainable forest management should ensure simultaneous and uninterrupted production of different ecosystem services'[241] through a landscape approach that combines more set-aside with best practice approaches in extensive (close to nature) and intensive forestry.

Proposal: Reducing logging impacts on biodiversity, and improving biodiversity of managed forests

Three 'types' of forestry are identified, synthesised from Buchwald's analysis of forest management approaches and ecosystem classifications (2005). Buchwald's analysis in turn synthesises many recognised forestry definitions including the FAO (and therefore Forest Europe), IUCN and the World Bank[242].

[240] European Commission (2021). EU Biodiversity Strategy for 2030: Bringing nature back into our lives. Luxembourg: Publications Office of the European Union

[241] FAO, 2003, cited by Díaz-Yánez *et al.,* 2019.

[242] Buchwald's typology is comprehensive, and this simplification of it is broadly consistent with other typologies of forest management approaches (such as Duncker et al, 2012). The Buchwald continuum is currently being utilised in EC Working Group on Forests and Nature (DG Env / D2 (Biodiversity) & D3 (Nature Protection) / Coordination Group for Biodiversity and Nature (re implementation of Nature Directives and 2030 Biodiversity Strategy – which has an objective to protect and map old growth forests). Also used by Sabatini *et al* (2018) to map Europe's last remaining old growth forests. It is recognised that this classification system has not been widely used by industry to date and that, if sustained, efforts will need to be made to raise familiarity with it, including providing examples of its application in practice. Furthermore, feedback on alternative classification systems is welcomed.

These types represent groupings of key forest management approaches on a spectrum of naturalness. “Forest naturalness correlates with forest structural diversity and with biodiversity...greater naturalness is one of the main prerequisites for maintaining global forest biodiversity and should be a main focus of forest and conservation management at all scales” (Winter, 2012, see also Watson 2018).

Naturalness has been one of Forest Europe’s criteria since 2003 (MCPFE, 2003)[243]. The European Environment Agency uses naturalness… “as a reference for assessments of the degree of degradation of forest ecosystems” (e.g., see EEA 2016, p.52), noting that primary forests are of high conservation value (HCV), that semi-natural forests can be, but plantations cannot[244]. The EC acknowledges the naturalness spectrum implicitly by seeking to protect all remaining old growth forests (EU Biodiversity Strategy 2030), recognising their superior value to modified forests.

The three types of forestry are:

- **Exotic plantations**, “Buchwald P2”: plantations of non-native tree species where the stand origin is artificial by planting or sowing.
- **Native Plantations,** “Buchwald P3 & N1”: “P3 = intensively managed, even-aged stands consisting of native trees, established artificially by planting or sowing with regular spacing” and “N1 = plantation-like natural forest, predominantly self-sown native trees with high-intensity management so that the forest structure has become plantation-like by being even aged, relatively low tree ages, fairly regular tree spacing”.[245]

[243] (Criteria 4.3, see Forest Europe 2015)

[244] Plantation forests have lower biodiversity compared to intact forest ecosystems. “Lower biodiversity in plantation forest compared to other forests was reported by 94% of the reviewed studies (Sky & Wagner, 2007). “Intact forest ecosystem have... consistently higher numbers of forest-dependent species“ (Watson, 2018). Many of the reasons for this are clearly evidenced in Table 1.

[245] Coppice systems may also meet the stipulations in Table 1 for this category.

- **Close to Nature Managed Forest** (CTN) = "Buchwald N2 & N3": "Exploited natural forests, self-sown native trees without plantation structure, with a characteristic forest structure with interesting biodiversity". Also includes plantations transitioning into CTN.

The criteria are tailored to these three types). This enables a flexible but rigorous approach that gives the opportunity for all forms of forestry, anywhere in the world, to substantially contribute to biodiversity and ecosystems subject to differentiated criteria. It draws on lessons from Triad Forest Management in which a forest operation may be divided between set aside, and intensive and extensive (i. e. close to nature) forestry operations.

Examples of these approaches being implemented include intensive plantations already allocating these levels of set aside (e.g., one third in South African forestry, a third in WWF's New Generation Plantations, one half in the Mata Atlantica pact). And studies are referenced in Table 1 evidencing the viability of close-to-nature approaches (alternatively known as continuous canopy forestry, uneven aged forestry).

The criteria integrate and build on best practice principles in biodiversity conservation and forestry initiatives. The Forest Europe process, for example, includes a definition of 'sustainable forest management' and, under its Criterion 4, sets out 10 'indicators' to address its 'Criterion 4: Maintenance, Conservation and Appropriate Enhancement of Biological Diversity in Forest Ecosystems'[246]. A key problem to date has been lack of minimum standards within these to ensure biodiversity is maintained (or enhanced), and a deferral to national level, often via forest certifications, to monitor compliance with these undefined 'indicators'.

The need for the taxonomy to drive improvement is clear. Europe has only 5% remaining undisturbed forests - half of which are in Finland, Sweden, central and eastern Europe. In Finland, more than 90% of forests are PEFC certified, and yet 76% of forest habitats in Finland are now threatened, and another 21% are nearly threatened" (Finnish Environment Institute, 2018 & Kontula & Raunio, 2019). The situation in Sweden is similar: despite high levels of forest certification, remaining high conservation value (HCV) intact forest landscapes are being clear felled and sensitive species are decreasing as numbers of red list species increase

[246] Forest Europe (2015). Madrid Ministerial Declaration, Seventh Ministerial Conference. Annex 1: Updated pan-European indicators for sustainable forest management.

(Angelstama et al 2020, Sweden Forest Agency 2021). The EU Court of Justice recently (March 4th 2021) pointed out that Swedish legislation is failing to implement a proper protection of Swedish forest habitats and species according to the Nature Directives[247].

The criteria presented herein are compatible with Forest Europe's Criterion 4 – but define clear safeguards and indicators to define minimum standards and achieve significant contribution to biodiversity.

They criteria combine two areas of implementation – set-asides and in-stand measures, in order to:

- Safeguard and improve the state of natural and semi-natural forests (SC 1A and SC1B)
- Ensure pressures on forest biodiversity are reduced in intensively managed systems (SC 2B)

[247] "Reserves alone are insufficient to adequately conserve forest biodiversity (Sugal, 1997; Daily et al., 2001; Lindenmayer et al, 2002), in part because 92% of the world's forests are outside formally protected areas. Large ecological reserve systems are rarely comprehensive, representative and adequate for all elements of biodiversity (Margules and Pressey, 2000; Scott et al., 2001). In other cases, past land management means there are few or no opportunities to set aside large ecological reserves (e.g., in parts of southern Sweden; Gustaffson et al., 1999).

"Fragmentation of intact forest blocks (and associated edge effects) is a severe threat to forest-dependent species, especially those requiring large areas to maintain viable populations (e.g., predators, trees occurring at low densities)" (Watson 2018).

Climate change greatly underlines the need for habitat continuity throughout the landscape as species will be forced to move to new areas as local conditions change (Carvalho et al, 2021). e.g., African Apes expected to lose 90% of their range in coming decades, half this loss from changes in suitability of protected areas (Carvalho et al, 2021). Landscape matrix is therefore key.

"Hence, credible plans for forest biodiversity conservation must incorporate off-reserve approaches that complement reserve-based approaches" (Lindenmayer and Franklin, 2002; see also Angelstama et al 2020, Felton et al 2020, IUCN 2020, Ellis et al 2021, Lindenmayer et al, 2006 & 2016; Ellis, 2019; Samways & Pryke 2016, and many more)."

"In most cases, effective designs should incorporate strategies for increasing forest cover (restoration) and improving the quality of the surrounding anthropogenic matrix" (Arroyo-Rodrigue et al 2020, citing many others).

- Recognize the higher biodiversity value of, and encourage the increase in, close-to-nature forestry as compared to plantation forestry (SC 2A).

In particular, the criteria aim to:

- Reducing logging impacts: Clear and necessary stipulations are set out to prevent the ongoing destruction of quality forest habitat, crucial for meeting EU Biodiversity Strategy targets.

- Improve biodiversity of managed forests: In areas where forestry activities can proceed without inflicting major damage on natural systems, a landscapes / systems approach is presented, as widely called for in the literature. This approach recognizes that strictly protected areas are currently insufficient in size, and insufficiently connected through the landscape, to achieve global and EU conservation goals (even more so in the context of climate change), so the wider working landscape must play its role in providing habitat for biodiversity.[36] In addition, cross-cutting safeguards that apply to all types of forestry, anywhere, are also set out, and monitoring tools are deployed to track improvements in forest structure and biodiversity.

Approach to setting the criteria

Table 1 presents the criteria that must be met in order for the activity to be recognized as making a substantial contribution to the protection and restoration of biodiversity and ecosystems. These cover a range of management aspects, taking into account the many ways forestry and logging impact upon biodiversity and ecosystems. Sections marked with a '^' represent safeguard levels of performance. Together, as a bundle, compliance with these criteria would demonstrate a substantial contribution to the protection and restoration of biodiversity and ecosystems.

The intention has been to set base criteria that are not reliant on local regulations or standards, that can be interpreted in all locations and contexts globally, and use globally recognised terminology. Once these criteria are established, then existing regulations or legislation, or certification schemes such as FSC or PEFC or any other systems can be evaluated for compliance with these base criteria. Where compliant, that regulation, scheme or other would then represent established 'proxy indicators' for all or part of these criteria, increasing the usability of the criteria.

The criteria

From a review of the scientific literature, these criteria have been selected because they deliver substantial impacts for biodiversity and ecosystems with relatively high certainty across a range of biophysical and forestry conditions. They should therefore be widely applicable. It will, of course, be necessary to regularly review this list of practices to integrate new advances in scientific knowledge.

The scientific literature provides insights on the impacts on biodiversity and ecosystems from various forestry management practices. However, it is a complex topic covering many biomes. Platform expert input was used to determine the minimum combination of practices which should be applied together to deliver a substantial contribution at forest holding level. Whilst forestry operations and biotopes differ, being based on evidence-backed principles, it is expected the deployment of this bundle will deliver much needed substantial contribution in the vast majority of cases.

That said, it is noted that these global criteria may not fully address local and regional variation and the specific needs of the variety of forest habitats. Feedback on the extent to which these criteria should and could address regional specificities while delivering a commensurate substantial contribution to biodiversity and ecosystems as captured by these criteria is welcomed.

Supporting evidence for each of the essential practices that form the criteria are given in Table 1.

Table 1: Criteria for reduced logging impacts on biodiversity, and improved biodiversity of managed forests

Criteria	Rationale
1. Provision of high biodiversity forest areas	
1.1 Conservation of existing high-biodiversity forest areas **1.1.1 The activity has not (since 2008 or anytime thereafter) involved the conversion or fragmentation of, or**	To avoid significant harm, existing high biodiversity landscape areas need to be safeguarded whether or not they are under legal protection. Wood extraction is sometimes permitted within areas of high conservation value –

logging or other commercial forestry activities within: • Areas protected or set aside for restoration, in which logging activities are prohibited, in accordance with international and national law • Primary, old-growth forests, and forests undisturbed by man, within and beyond protected areas • High Conservation Value forests[248] i) containing globally, regionally or nationally outstanding or critical significant biodiversity values (endemism, rare, threatened or endangered species, habitats, refugia, or ecosystems); or ii) large landscape level forests, contained within, or containing the management unit, where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance; or iii) forest areas that provide basic services	such as in some IBAs and KBAs which may not have legal protections. In Natura 2000 sites, forests may or may not be permitted extractive activity. Where not permitted, this must be adhered to. In IBAs and KBAs, **On long untouched forest:** Long-untouched forest has had "decades without forestry operations", is often in marginal growing areas hence abandonment and represents conservation opportunity as naturalness features recover. If slow-growing species are being managed, there will have been maintenance forestry operations over the decades between harvest – e.g., thinning, maintenance of access, etc. Buchwald defines 'long untouched" as for 60-80 years. "Newly untouched" he defines as where forestry operations have been abandoned for less time,

[248] As defined in FSC-STD-01-001 V5-2. These criteria require HCVs 1-4 to be protected from conversion, fragmentation, logging or other commercial forestry activities:
HCV 1 – Concentrations of biological diversity including endemic species and rare threatened or endangered species that are significant at global, regional or local levels.
HCV 2 - Landscape level ecosystems and mosaics. Intact forest landscapes and large landscape-level ecosystems and ecosystem mosaics that are significant at global, regional or national levels, and that contain viable populations of the great majority of the naturally occurring species in natural patterns of distribution and abundance
HCV3 – Ecosystems and habitats. Rare, threatened, or endangered ecosystems, habitats or refugia
HCV4 – Critical ecosystem services – Basic ecosystem services in critical situations, including protection of water catchments and control of erosion of vulnerable soils and slopes.
HCV 5 & 6 are primarily about social aspects, which although not the focus of these criteria, ought to be respected alongside, as part of the rationale of how to conserve the biodiversity sites covered in HCVs1-4.
HCV 5 – Community needs (though arguably beyond main focus of these criteria, it includes 'sites and resources fundamental for satisfying the basic necessities of local communities or indigenous peoples (etc) - and such relationships with land can be important for effective custodianship of biodiversity, so should also be included.
HCV 6 – Cultural values – again, arguably not principal scope of these criteria but does include sites of ecological/sacred importance – which again can be important aspect of ecological custodianship, so should be included.
Further work will be undertaken to determine the equivalence of similar definitions in PEFC (PEFC ST 1003:2018) in particular relating to 'ecologically important forest areas' (EIFAs). In which case reference to those will also be included here.

of nature in critical situations (e.g., watershed protection, erosion control) • Long untouched forest (60 years plus without commercial logging)[249] • Wetlands and aquatic habitats, as listed under The Ramsar Convention on Wetlands, encompassing peatlands, floodplains, riparian zones (see below), aquatic (rivers, ponds, springs, etc) and coastal habitats. • Riparian Buffer Zones of at least 30m either side of a linear water course (I.e., 60m total, or higher if required by national legislation) and continuous along water bodies and covering all stream orders including ephemeral streams and first order streams. . • High biodiversity farming areas[250] – that support either a high species and habitat diversity and/or the presence of species of national and/or regional	which would also be a valuable opportunity for biodiversity as often forests begin shifting noticeably to uneven age structure, more deadwood etc, within a few decades. However, a landing zone in the middle (60 years) is proposed based on expert input received. **On floodplain forests:** There are few floodplain forests left in Europe due to many land-use pressures, watercourse alterations, etc. **On riparian buffer zones**: Contiguous riparian zones are important habitats in themselves, contribute to habitat continuity, and are essential for maintaining river biodiversity and ecosystem services (Cole et al., 2020; Riis et al, 2020, Hilary et al, 2021, etc). Rivers are arguably the most threatened of all ecosystems, and riparian zones are

[249] If a forest has had some non-commercial firewood felling, for instance, or if a 50-ha continuous forest patch has one small felled clearing in the middle of it as an anomaly, the areas should be considered untouched.

[250] This terminology is based on High Nature Value farming principles in Europe, slightly altered to make more globally applicable and relevant to taxonomy. "The High Nature Value (HNV) farmland concept has been widely adopted across Europe in agricultural policy. High Nature Value farmland comprises those areas in Europe where agriculture is a major (usually dominant) land use and where that agriculture supports or is associated with either a high species and habitat diversity, or the presence of species of European, and/or national, and/or regional conservation concern or both. Within this definition three types of HNV farmland are identified: • Type 1: Farmland with a high proportion of semi-natural vegetation • Type 2: Farmland with a mosaic of low intensity agriculture and natural and structural elements, such as field margins, hedgerows, stone walls, patches of woodland or scrub, small rivers etc. Type 3: Farmland supporting rare species or a high proportion of European or world populations. (EC 2018. Farming for Natura 2000 Guidance on how to support Natura 2000 farming systems to achieve conservation objectives, based on Member States good practice experiences. Management practices likely to be relevant are covered pp.42-46.)

conservation concern. These will be recognised by national authorities as of conservation importance - e.g., in Europe, through High Nature Value farming typology[251] and/or farms included in Natura 2000 network[252]. Examples include agroecosystems with extensive native vegetation such as biodiverse permanent grassland or agroforestry with native tree species. • Corridors (intentional or de-facto) of natural or semi-natural vegetation that connect HCVF areas. **1.1.2 Land conversion to forestry of any areas not included in the above, was (or will be) carried out in accordance with the conclusions of an EIA addressing specifically biodiversity and necessary mitigation measures are implemented**	essential in safeguarding river quality (Samways & Pryke, 2016). Depending on the type of habitat, soil, surrounding slopes etc, different widths for sufficient riparian buffers are presented in the literature, generally ranging from 30m to 600m[253]. We have cited the lower range in these criteria although it extending this will often be a sensible design of set aside.
1.2 High biodiversity landscape forest areas are created or maintained in line with the following thresholds:	These criteria ensure all types of forestry can make a contribution to quality habitat. Plantations retain the ability to operate intensively in portions of the land

[251] Halad *et al.,* 2011. Which Habitats of European Importance Depend on Agricultural Practices? Biodiversity and Conservation.

[252] EC 2018. Farming for Natura 2000 Guidance on how to support Natura 2000 farming systems to achieve conservation objectives, based on Member States good practice experiences.

[253] Brazil Forest Code 2012 – min. 30m, max 100m – buffer to be half the width of the water body.

Yale (Hawes & Smith, 2005) :(p.8): For water bodies where surrounding land is slope of more than 15% Yale recommend 32.5m. Aguiar (2015): The higher efficiency of woody vegetation zones of 36m and 60 m widths, combined with agricultural economy, presents a greater potential for acceptance by rural producers. Woody vegetation buffer zones are far more effective than herbaceous (see Table 1). Samways & Pryke (2016) and Nilsson (2021) recommend 30m. 500m buffer zones for rivers wider than 600m (see Wenger et al 2018).

• **Exotic plantation forestry**: The higher of a) 50% of the FMU, b) any % threshold set in national legislation, c) existing high biodiversity landscape areas in the FMU per 1.1.1 • **Native plantation forestry**: The higher of a) 20% of the FMU, b) any % threshold set in national legislation, c) existing high biodiversity landscape areas in the FMU per 1.1.1 • **Close to nature managed forest**: The higher of a) 10% of the FMU, b) any % threshold set in national legislation, c) existing high biodiversity landscape areas in the FMU per 1.1.1 N.B.: • For Exotic Plantation Forestry, up to 20% of this can come from productive Close to Nature forestry, the remainder coming from set-aside. • For Native Plantation Forestry, all of this must come from set-aside • For Close to Nature Managed Forest, all of this must come from set-aside • Areas of habitat listed in 1.1. contribute to set aside. • Set aside can include blocks or corridors of native forest. De-facto set asides (areas not being exploited within the FMU) should be retained and not reduced in extent *Methodological notes:*	(where quality natural/semi-natural forests have not been present since 2008), whilst also allocating land to set aside and unlogged or close-to-nature forestry. This gives the land-owner flexibility to choose their approach – either a Triad Forest Management approach, or intensive operations with land sparing (set-aside). Unlogged areas (set aside) are necessary as biodiversity loss (both in species richness and abundance within populations) correlates with intensity of logging (see Section 2 below). Within stand operations can have a longer rotation period, leave retention trees, leave some dead wood, etc, but will still be missing a lot of biodiversity that is only retained in completely unlogged patches left untouched permanently. This is why attempts to find an optimal balance between logging and biodiversity[254] inherently involve loss of some species, making set-asides essential. Set asides are required to build up natural habitat structure and levels of deadwood needed by forest specialist species (e.g., in Europe, a third of forest species depend on deadwood - IUCN 2004). Species are lost at even low levels of deadwood reduction (See deadwood section, 2.3, below). Unlogged areas also help increase total quality forest habitat (important to retain species requiring large amounts of habitat) and landscape habitat connectivity. Set-asides can provide essential refuges during forestry

[254] e.g., Guburek et al (2010)

Flexibility is given to the operator to decide in their FMP the spatial allocation which is most effective for biodiversity whilst practical for operations. *Design of set-aside areas can be multifunctional and beneficial to productivity - e.g., reducing wind, soil loss from steep slopes and riparian verges, conserving water resources and providing habitat for species which can help control pests (e.g., insectivorous birds regarding pine processionary moth).* *The IUCN provides guidelines on the implementation within FMUs of 'ecological networks' - the designed-landscape of set aside areas that include corridors and buffers) (IUCN 2020). Various resources exist to guide optimal design (see also Lindenmayer et al, 2006; Samways & Pryke, 2016; Arroyo-Rodriguez 2020).)*	harvesting (for example orangutans, see Ancrenaz et al., 2010). Because intensive plantations of exotic species are extremely low in biodiversity, and because their management is so far removed from natural forest dynamics, their % of set aside should be highest (but, with less imposition of in-stand practices). Native plantations should have intermediate level of set aside and impositions of in-stand practices. Closer-to-nature forestry, utilizing the full suite of native species in uneven age structures, should require the least set aside. These adjustments in set asides reflect not only the different biodiversity of these approaches to forestry, but also recognize and promote moves from from monoculture plantations to more mixed forestry. **Size of set-aside** Abundance of forest species drops as soon as habitat is lost, and local extinctions can begin very early when reducing extent of natural forest (e.g., at 75% forest -see Price et al, 2007 & Thorn et al 2020). This is why conserving all quality remaining forests is essential, and no reductions should take place within forestry units. The set-aside %s presented will improve biodiversity in those forestry operations which are below these levels. In the least natural forest types (exotic plantations), it is logical to ensure set-aside is sufficient at least to avoid critical thresholds below which a final collapse of forest species occurs – generally between 30% and

	60%[255]. The criteria therefore stipulate 50% of exotic plantation land should be high biodiversity - either all as set-aside, or with the option of putting up to 20% into productive CTN forestry (in which case, 30% as pure set aside). These thresholds will not always be sufficient to safeguard viable populations of all forest species. However, compared to the baseline of business as usual they will be a significant contribution. **Feasibility** There are many examples of companies implementing these approaches on large scale: • South Africa allocates one third of its plantation forestry area (half a million Ha) to set-aside (Samways et al., 2009). • "New Generation Plantations" partnership (WWF and major forest companies) allocate approx. one third as set aside (WWF 2017), the rest as intensive plantation. • Mata Atlantica Forestry Pact – 50% is set aside – 1 million Ha - by companies including Fibria, Suzano

[255] 25% – 50%: "Recent studies in tropical forest landscapes found…forest cover thresholds (25– 50%) for plants, birds and insects (Rigueira et al. 2013; Morante-Filho et al. 2015; Boesing et al. 2018; Pinto et al. 2018)" (see Arroyo-Rodriguez). 40%+: Arroyo-Rodriguez – at least 40% in the tropics – assuming the wider landscape is a 'high quality' matrix. 30%: Atlantic Forest studies show critical thresholds of "approximately 30% of native [forest] habitat is needed to preserve the integrity of vertebrate communities within each landscape" (Banks-Leite *et al*, 2014).

	and Veracel in Atlantic Forest area, Brazil). "Triad scenarios with 74% extensive (I.e., CTN), 12% set aside, and only 14% plantation, outperformed the status quo both in terms of the area of forest with old characteristics (a biodiversity proxy) and wood supply."[256] Close to Nature (CTN) forestry (common synonyms for which include 'extensive forestry' and 'continuous cover forestry')**)** is broadly defined by Prosilva (2012). It should not be assumed that CTN forestry is less profitable than plantation forestry, or even clear cut (over the medium term). Analysis of Finnish forestry shows continuous cover forestry to be more profitable than rotation forestry, as well as higher performing on all ecosystem services including biodiversity[257]. Triad Forest Management also commonly outperforms status quo approaches (see Coté et al, 2010[258]).
1.3 Management of high-biodiversity forest areas: **1.3.1. FMP includes habitat restoration and management measures that ensure**	In many cases it will suffice simply to allocate set-aside areas and allow natural regeneration to occur.

[256] Betts et al. 2021, citing Coté et al 2010.

[257] "It has been found that uneven aged management is, in most cases more profitable due to absence of stand establishment costs and a more favourable assortment distribution of harvested timber (Tahvonen 2009; Tahvonen et al. 2010; Pukkala et al. 2010)" (cited by Pukkala et al, 2011). Most recent, Pukkala (2001a & b) analyses Finnish forestry and finds continuous cover forestry more profitable than rotation forestry in both north and south Finland (as well as higher performing on all other ecosystem services, from biodiversity to carbon sequestration). See also Díaz-Yánez et al., 2019.

[258] Coté et al (2010) model several forestry scenarios, in which half of the triad forest management scenarios produce more harvest volume than standard industry practices and government proposed practices.

native vegetation and natural ecosystem processes can occur or resume, requiring but not limited to: • removal of exotic and invasive species, • restoration of natural hydrology (e.g., peat soils), etc. • enrichment planting, • stump removal, • regular cutting of former plantation trees to weaken them and allow natural regeneration to take over. These measures adhere to safeguards elsewhere in this proposal (e.g., chemicals, drainage, etc). **1.3.2. These measures to be monitored through use of a biodiversity / forest structure index approved by national conservation authorities must be utilised** to record stand-level forest structure in representative sample of set-aside areas, and demonstrate ongoing improvement (or no regression if pristine quality). **1.3.3. To ensure high-biodiversity forest areas are functioning well, they are monitored using forest quality tools.** *Methodological note: Forest quality tools might* include*:* • *Geburek et al (2010) - Austrian Forest Biodiversity Index* • *Whitman & Hagen (2007) - a boreal forest index* • *(See also Pukkala 2021b)*	In some cases, however, the land may struggle to recover natural structure and function without some intervention. Some examples include: • if dominant tree cover of a previous exotic plantation species will persist and impede natural regeneration • if an invasive species has proliferated and similarly blocks natural regeneration • if there is an absence of soil seed bank or seed sources nearby for re-establishment of a representative community of native species if natural hydrology or soil condition of the area has become so degraded those measures are required to re-establish viable conditions.

<table>
<tr><td>1.4 Permanence of high-biodiversity forest areas

The following are mapped in the FMP and are to remain permanently in place:

• High biodiversity areas not to be exploited (see 1.1)

• High biodiversity areas created (see 1.2)

• Close to Nature forestry areas

– unless a convincing conservation rationale is presented for altering the spatial lay-out with demonstrable biodiversity net benefits.</td><td>Biodiversity value of forests increases over time, for instance as deadwood accumulates.</td></tr>
<tr><td>2. Forest structure, function, and composition^

I.e., within-stand operational safeguards</td><td></td></tr>
<tr><td><table>
<tr><th></th><th>Exotic plantations</th><th>Native plantations</th><th>Close to Nature managed forest</th></tr>
<tr><td>2.1 Age-structure & retention</td><td>-</td><td colspan="2">2.1.1. Uneven age structure: within specific harvest plots, presence of all age classes from sapling to mature, senescent and dead trees.

2.1.2. Retention trees:

• 30 mature trees per Ha or 10% standing wood</td></tr>
</table></td><td>Fewer stipulations are given for exotic plantations than for native plantations and CTN. The biodiversity contribution of exotic plantations is mainly through set-aside due to the impossibility of their hosting a naturally occurring tree cover of uneven age structure that supports all taxa of biodiversity. Native plantations have intermediate level of stipulations, with intermediate level of set aside. CTN stipulations ensure the higher biodiversity structure of close to nature operations, with least required set-aside.

On retention trees and age-structure

The more wood is removed from a forest, the greater the impact on biodiversity as studies across taxa show (Watson et al., 2018). Mammals and amphibians suffer a halving of species richness between logging intensities of 38 m (3) ha (-1) and</td></tr>
</table>

		volume – whichever is larger; AND • The largest trees are left as retention trees, and the same trees remain in future harvest cycles		63 m (3) ha (-1), and the more logged an area, the more forest bird species are replaced by generalists (Burivalova et al 2014).: Retention forestry is a within-stand approach to maintain elements of mature forest - the more trees are retained at harvest, the better the biodiversity outcomes. Different metrics are used - % trees left standing (which can vary from 1% in part of Finnish forestry to more than 40% in parts of Canada), to number of trees, to standing volume (Gustaffson et al, 2012). Metrics are used to ensure minimum levels of wood retention – to preclude retaining only a great many immature trees. Latvian forest regulation stipulates the biggest trees should remain as retention trees. **On harvest area** The extent of forest openings created during harvesting is another important factor. Restrictions are not placed on exotic plantations, as their principal contribution is through more set-aside. Where exceeding natural gap dynamics, clear cuts represent habitat destruction[262] and the bigger the harvest area, the bigger the habitat disruption (Ceccherini et al., 2020). Between 2015
2.2 Clear cutting / Harvest gap creation[259]	-	**2.2.1. Max clear cuts**: 1 ha in broadleaf forest, 3 ha in conifer forest[260]	**2.2.1. Max clear cuts**: 0.3Ha	
		2.2.2. Harvest gap: At least 100m between clear cuts / harvest gaps		
2.3 Deadwood	-	**2.3.1. No extraction of deadwood** (trees, snags, stumps, logs, etc) **2.3.2. Management guarantees accumulation of at least 20m^3 Ha^{1,} of the largest possible diameters**		

[259] See also section below on 'logging restrictions on steep terrain'

[260] Belgium FSC

[262] This may not be considered 'deforestation' according to the FAO definition, however, if 10% is left unlogged and the land use classification is left unchanged.

2.4 Tree species selection	-	**2.4.1 Stand composed of at least 3 native species**[261] (minimum 20% area for each), and allowing all naturally regenerating native tree and shrub species to be present	**2.4.1. Natural tree and shrub layer** (all local species are present in viable populations including non-productive species)	and 2018, clear-cut sizes increased 34% in Europe, the increase generally due to cuts more than 7.2 Ha (ibid). In Sweden, the majority of forests are managed by clear felling systems with rotation of 45 to 100 years, with remaining High Conservation Value forests continuing to be transformed (see Angelstam et al,2020). In Canada, 'the current forestry regime involves clear cuts of up to 150 Ha." (Côté, et al 2010). Differential harvest area stipulations are given for native plantations and CTN (see FSC Belgium, also Valknonen 2019). **On deadwood** Deadwood is an essential feature of forests on which much biodiversity depends. In Europe, up to a third of European forest species depend on veteran trees and deadwood for their survival (IUCN 2004), perhaps more in natural conditions **- h**alf of Bialowieza's 12,000 species are dependent on decaying logs (see EEA 2016, p.50). Species are lost as deadwood levels decrease. In a Finnish study, out of 8 threatened indicator fungi species, none were found in stands with less than 20m3 / ha decaying wood, and only 2 species
	-	**2.4.2. Use of 100% native species and local genotype**		
2.5 Invasive species	**2.5.1. No use of known invasive, alien species** – in accordance with competent body's guidelines (in Europe, Regulation (EU) 1143/2014 on invasive alien species). **2.5.2. Risk assessment of potential impacts of non-native species**, and precautionary			

[261] In highly unusual circumstances of struggling to find 3 commercially valuable native species, not all 3 species need be commercially exploited (species may be included simply for biodiversity). Exceptions can be made in rare situations where less than 3 native species naturally occur (e.g., in poor sandy soil in Latvia there could be only Scots pine).

Climate change can be expected to alter distributions of species (e.g., moving latitude or altitude), in which case this can be taken into account through reference to updated classifications of local reference biomes and native species, for instance using Global Tree Search, which.

	principle employed to prevent spread of non-native species. **2.5.3. FMP explains measures to prevent introduction of invasives / naturalising species** including through route of planting material/machinery **2.5.3. FMP includes active management of spontaneous invasives** within management unit, in accordance with other safeguards			found at 20m3 / ha. (see Hanski & Walsh, p.22; also Valnonen 2019). Bouget et al (2014) similarly found beetle species only present in old growth forest conditions of deadwood. The main reason for declines in forest birds (e.g., several woodpecker species, specialist tits, forest game birds) are the steep decline in deadwood along with related changes in tree composition and age structure (Hanski & Walsh, p22): three-toed woodpeckers, for instance, are also very unlikely in forests with less than 20m3/Ha (Bütler & Schlaepfer 2004). European forests, without exploitation, would often average 130-150m3 / ha deadwood (Nilsson et al 2002). Today, European forests average 10m3 / ha (EEA 2017). Often it is practically nothing – in Finland just 1 to 1.4 m3 / Ha (Lier & Parviainen, 2013); in Fennoscandinavia, between 2 to 10m3 – a 90-98% reduction (Siitonen, 2001). This situation is mirrored globally. Usually, aboveground deadwood does not exceed 10m3 Ha / ha (FAO, and many others, cited by Svoboda & Bace, 2012). Forest certification standards do not guarantee ecologically meaningful levels of deadwood. Sweden's FSC standard stipulates leaving 3 standing dead trees per Ha: Swedish spruce forests average only 10.2 m3 deadwood / ha (Johnsson et al, 2016). These criteria do not stipulate deadwood levels for exotic plantations (where deadwood is of less value to native species) - their contribution is through the deadwood build-up in set aside.
2.6 Planting / regeneration			**2.6.1. Natural regeneration** only - except in situations where not feasible, e.g., due to lack of sufficient mother trees (either in number or species diversity), challenging restoration conditions, etc.	
2.7 Habitat connectivity	**2.7.1. Forest areas should ensure functional connectivity needs for priority species**, and this is explained in the FMP			

Habitat connectivity: Forest areas should ensure functional connectivity needs for priority species, as explained in the FMP.	Applicable in set-asides	Applicable in set-asides	Applicable in stand, and set-asides	Native plantations and CTN forestry have stipulation of at least 20m3. As shown above, this will not safeguard all species, but will be a significant improvement on average baselines and will retain some forest specialist species. Set asides are essential to ensure habitats where natural levels of deadwood, and of deadwood dependent species, can accumulate thanks to no-extraction of biomass. Deadwood in managed forests typically consists of fine woody debris (small twigs and branches) and short stumps (see Svoboda & Bace (2012). The full complement of dead trees, snags, stumps and logs should be present. **On native species** National and international databases on natural species distributions can be used to ascertain native species, such as Global Tree Search – which is a live database, offering practitioners the ability to check how, for instance, species may be changing latitudes in response to climate change (see Beech et al, 2017; Rivers, 2017).
2.8. No degradation / simplification of the composition, structure & function of utilised forests e.g., through reduced tree species richness, density, age-structure, and prevalence of dead wood. These measures to be monitored through use of a biodiversity / forest structure index approved by national conservation authorities must be utilised to record stand-level forest structure in representative sample of set-aside areas, and demonstrate				*"*Global sustainability agendas focus primarily on halting deforestation, yet the biodiversity crisis resulting from the degradation of remaining forests is going largely unnoticed. Forest degradation occurs through the loss of key ecological structures, such as dying trees and deadwood, even in the absence of deforestation" (Thorn et al, 2020). In addition to ensuring remaining high conservation value forests (listed in 1.1) remain unexploited, it is also important to safeguard against a creeping

ongoing improvement (or no regression if pristine quality). **(Applies to native plantations and CTN, not to exotic plantations)**	deterioration in the quality of forests that are used for wood extraction. Forest assessment tools can be used to monitor forest structural features on which biodiversity depends, and demonstrate no regression as well track improvements through the significant contributions made. This is not required of exotic plantations; however, whose principal contribution is through set-aside.
3. Fire prevention and control^	
3.1. If in a region prone to forest fire, a fire risk management plan is part of the Forest Management Plan. The fire risk management plan sets out: • **Fire risk assessment** (e.g., likely sources of ignition, wind directions, most flammable areas, biodiverse areas at risk, etc) • **Biodiversity oriented fire prevention plan** setting out measures on: • Preventing fire damage to biodiversity-sensitive areas (per section 1) • Responding to fire whilst preventing damage to forest biodiversity (e.g., harmful clearing understorey) **3.2. No use of fire** except prescribed burns where required for habitat management, and allowing natural fire dynamics where required by the natural ecosystem	In some areas, such as Indonesia, without a fire prevention plan there is the risk of fire spreading catastrophically to HCV forests. In many locations, flammable plantations pose risks to high biodiversity habitats.
4. Chemical use^	

4.1. Use of herbicides, pesticides, fungicides etc. In CTN only: No use of herbicides, pesticides or any chemicals other than for time-limited, localised control of exotic invasive species if mechanical treatment is not viable (in which case, the below to be adhered to). In exotic and native plantations only: • Pesticide use minimised through compliance with Integrative Pest Management as set out in Annex III, EU Directive 2009/128/EC. "Candidates for substitution' are not used. • No use of chemicals banned in EU (or nationally if outside EU) • Chemical-free buffer zones (200m) around high biodiversity forest areas (per section 1) • No aerial spraying of pesticides • Annual records kept of types and volumes of pesticides used	Measures are necessary to avoid toxic and persistent chemicals accumulating in soils, waters, organisms and food webs. In CTN, chemicals are not to be used on native insect pests (e.g., pine processionary moth in Portugal), which in near-to-natural forest conditions will have more intact predator-prey feedback mechanisms. Exceptions can be made for time-limited, localised control of exotic invasives (e.g., Asian longhorn beetle, in Europe). In plantations, where natural predator-controls are less likely to be functional, measures are required to minimise adverse ecological impacts. EU Directive 2009/128/EC aims to achieve a sustainable use of pesticides in the EU by reducing the risks and impacts of pesticide use on human health and the environment and promoting the use of Integrated Pest Management (IPM) and of alternative approaches or techniques, such as non-chemical alternatives to pesticides. General principles for IPM are given in Annex III of the directive.
4.2. Use of fertiliser In exotic and native plantations: 100% of fertilisers to be circular economy outputs (e.g., waste ash, etc.) In CTN only: no use of fertiliser	
5. Water management^	
5.1 No new drainage or improved efficiency (e.g., deepening) of existing drainage **5.2. Restoration of natural hydrological regime** - in CTN and set asides only	CTN forestry should be well adapted to local hydrology, and its hydrological regime should be intact. Plantation forestry should not require irrigation beyond establishment phase

5.3. Compliance with water abstraction licenses (according to local law) **5.5. No irrigation of forestry operations** – except if necessary for a limited period during seedling establishment phase. **5.6. No alteration of water bodies (diverting / canalising / damming of rivers, streams, etc.)**	as that would show inappropriate species selection or densities for location. This discourages plantation development in already water-stressed ecosystems.
6. Soil protection and use of machinery^	
6.1 Machinery is deployed in such a way as to safeguard good soil structure without deterioration such as soil compaction, disturbance, erosion. At least 90% of harvest area should be unaffected	Mechanization is now part of the daily routine of forestry operations. However, many studies are highlighting the negative consequences of uncontrolled mechanization and the compaction of forest soils, disturbance, erosion and impacts on soil biodiversity, water infiltration, etc. Regarding compaction, by reducing the porosity of the soil - an essential property for the proper circulation of water and gases (as well as maintaining hydrological ecosystem services) - it significantly disturbs the development of plants. Thus, soil compaction can increase the impact of certain diseases or predators. It opposes the development of the root system, thus affecting both the regeneration of stands and their productivity. Biodiversity is thus significantly and durably affected – for several decades or longer in some cases. Repeated use of heavy machines may also increase the internal road network with concomitant soil impacts and influence on access to forest (see Forest Access, below).

6.2 Logging restrictions on sloping terrain **6.2.1. Measures are taken sufficient to ensure soil erosion is prevented on sloping soils**. The following apply to all forest types (exotic and native plantations and CTN, except where specified otherwise). On slopes of 10-20 degrees (all forestry types: exotic and native plantations and CTN): • Maximum harvest gap 1 Ha (exotic and native plantations) • Maximum 10% sloping area can be logged in one rotation • Minimum 100m between harvest gap On slopes of 20-35 degrees: • 0.3 Ha maximum harvest gap • Maximum 10% sloping area can be logged in one rotation • Minimum 100m between harvest gap No harvest on slopes of: • 20 degrees or more (very high erosion soils) • 35 degrees or more (any soils) N.B. The above figures are not averages (steeper areas within an overall flatter average are to be treated according to the above stipulations)	Logging – sometimes even with best practices in place - can lead to unsustainable levels of soil erosion. This not only reduces soil biodiversity but has a range of impacts on biodiversity through altered hydrology, not least impacts to downstream freshwater and estuarine environments. Sediment thresholds can be exceeded in aquatic ecosystems resulting in changes in composition of freshwater species. Local conditions and thresholds should be considered and not exceeded (Wenger et al 2018), and harvest methods, machinery, design of extraction tracks etc, planned carefully (e.g., see Haas et al 2021). Some countries set no-logging rules on slopes above threshold gradients. Restrictions are sometimes placed on any logging above certain altitudes (with implications not only for erosion but also rain generation), which is not addressed here. The criteria proposed herein set safeguards against high erosion practices, but much discretion remains in the hands of operators. It is to be hoped a precautionary principle approach will be adopted by operators keen to safeguard the essentially non-renewable resource of soil on which forestry also depends (see Edwards & Zierholz, 2001). Where operators have high altitude forests and steep slopes, these areas may lend themselves well to set-aside (although set-aside should ideally also include lowland forest – which can be the most biodiverse).

	The figures and rationale above are primarily based on Wenger et al. 2018, and sources therein. See footnote for examples[263].
6.3. Harvest methods on wet soils No heavy machinery use on waterlogged soil.	To prevent damage to soils from movement and/ or compaction. The operator may consider a range of approaches from avoiding harvest in wet periods, to use of lighter machinery, zip lines, horses, etc.
7. Forest access and security^	
7.1 No expansion of roads into roadless areas **7.2. The FMP sets out how forest will be safeguarded to prevent access from adverse external influences** including (but not necessarily limited to): • Unauthorised logging • Unauthorised mining • Unauthorised hunting • Unauthorised extraction of other resources (e.g., NTFPs)	Roads are a proxy for deforestation when established in natural forests, enabling a range of destructive practices to encroach, intensify, and lead to habitat destruction, fragmentation and deterioration. In other contexts, roads may also attract illegal or unhelpful (motorized) traffic (e.g., quads and motorbikes) that can be detrimental to soils and watercourses, cause disturbance of species, etc.

[263] At low levels of logging (10%) with best management practices in place, the environmental water quality is rarely exceeded" (in the Solomon Islands).

Selective harvesting only on slopes above 20 degrees (Solomon Islands).

No harvest on slopes more than 20 degrees on very high erosion soils, or 31 degrees on high erosion soils (Code of Practice for Forest Harvesting in Asia-Pacific), no harvest on slopes more than 22 degrees (Guyana), 24.2 degrees (Brazil), 25 degrees (Fiji), 30 degrees (Vanuatu). No harvest on hilltops and ridges above 100m and mean slope 14 degrees or more (Brazil).

All the above from national logging codes cited by Wenger et al, 2018.

The above do not exclude usage by indigenous peoples and authorised and sustainable utilisation arrangements, which do no prejudice biodiversity, made with local communities	
8. No direct harm to wildlife	
8.1. No intentional capture or killing of vertebrate wild animals other than: • For legally permitted subsistence or recreational wild hunting (adhering to all laws on target species, methods, season, quota etc.) • Indoor pest control – measures to prevent affecting non-target animals. Only EU permitted chemicals used. (See section 4: Chemical use) • Control of invasive alien species or species control as part of a biodiversity conservation plan sanctioned by a competent national authority • No use of unselective methods in accordance with EU Habitats Directive Annex 6 **8.2. No intentional killing of species (any taxa) classified by national or international IUCN red lists as 'near threatened' or more severe categories (e.g., vulnerable, endangered, critically endangered, etc)** **8.3. Limiting barriers to wildlife movement** Fencing & other barriers (permanent and temporary) should not interrupt movement capabilities of wild animal populations, especially migratory species. Where fences are used (e.g., to protect seedlings) extensively enough to affect movements of wild species, wildlife connectivity needs to be identified and sufficient measures taken	Unselective methods stipulation – relevant to hunting as well as control of invasive species and measures being taken under a conservation plan.

to enable movement (e.g., design of or gaps in fencing, tunnels, bridges, etc).	

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1.4 Fishing

Description of the activity

These criteria cover fishing on a commercial basis in ocean, coastal or inland waters.

In accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006, these activities are classified under the following NACE codes:

- 03.11 – Marine fishing
- 03.12 – Freshwater fishing
- 10.20 – Rental of pleasure boats (partial – where rental is for fishing)
- 84.24 – Fishing practiced for sport or recreation and related services
- 10.11 – Processing of fish, crustaceans and molluscs on factory ships or in factories ashore (partial – only covering where processing on factory ships)

If the sport, recreational or other fishing has associated onshore accommodation (e.g., fishing camps), the activity is not covered by these criteria, but instead the criteria for the activity: “Hotels, holiday, camping grounds and similar accommodation”.

Substantial contribution to the Protection and restoration of biodiversity and ecosystems

Satisfy all of the criteria described in Table below.

Criteria	Rationale
1. Harvest level	
1. **Not overfished or undergoing overfishing**[264] **For commercial catch fishing:** 1.1.1 Operating in a fishery which complies with established catch limits set at Maximum Sustainable Yield (MSY) with at least 50% of spawning biomass unfished, based on stock status[265] and fishing mortality below MSY taking into account an ecosystem-based approach 1.1.2. Report data through the EU catch registration system in place on control under the data collection framework (or equivalent outside the EU)[266] 1.1.3 Not operating in a fishery where targeted species are threatened or endangered[267] **For recreational and sport fishing:** 1.1.4. Comply with 1.1.1 to 1.1.3 OR Practice catch and release where near complete survival rate can be proved	An ecosystem-based approach is required to assess the state of stocking levels within the fishery, taking into account collective impacts of extraction and bycatch on biodiversity levels and habitats. According to Article 2 of the CFP (2013): "The CFP shall apply the precautionary approach to fisheries management and shall aim to ensure that exploitation of living marine biological resources restores and maintains populations of harvested species above levels which can produce the maximum sustainable yield. In order to reach the objective of progressively restoring and maintaining populations of fish stocks above biomass levels capable of producing maximum sustainable yield, the maximum sustainable yield exploitation rate shall be achieved by 2015 where possible and, on a progressive, incremental basis at the latest by 2020 for all stocks". However, MSY target may not be enough in itself. Biomass at sea larger than MSY could

264 These criteria go beyond the requirements under the current CFP with scientific references to support the rationale behind it: Scientific articles: Pauly & Al, 2020; Cury et al., 2011; Pikitch et al., 2012, FAO, 2011, Pauly 2020; Food for Thought Contribution to the Themed Section: 'A tribute to the life and accomplishments of Sidney J. Holt', ICES Marine Journal

FAO Review of the state of world marine fishery resources. FAO Fisheries and Aquaculture Technical Paper No. 569. Rome, FAO. 2011. 334 pp, http://www.fao.org/3/i2389e/i2389e.pdf

265 Stock assessments performed by the Scientific, Technical and Economic Committee for Fisheries (STECF)

266 This aligns with CFP requirements

267 Targeted species lists (based on BHD, Regional Sea conventions, CITES, IUCN, etc.)

	be also considered desirable, as it increases the resilience of the fish stocks, and when closer to MEY (maximum economic yield), increases the profitability of the fleets exploiting the stocks.[268] Schaefer's original concept of Maximum Sustainable Yield ('MSY') argued that a 50% carrying capacity was generally sufficient to generate MSY. However, current common population biomass levels are of 30-40% of carrying capacity. In addition, by being comparatively less data-hungry than other assessment methods, the MSY concept can greatly support ecosystem-based fisheries management (EBFM) if effectively set at 50% of SSB[269].
2. **Avoid by-catch**[270]	Seabirds are most vulnerable to mortality on longline hooks during the short period between

268 Single-species stocks should be maintained at biomass levels above 60% of carrying capacity to provide food for fish-eating seabirds, marine mammal populations, and other large predators (Cury et al., 2011; Pikitch et al., 2012, Pauly, 2020).

269 For a summarized discussion, see: http://www.seaaroundus.org/fisheries-managers-should-not-abuse-maximum-sustainable-yield/, see FAO, FAO Review of the state of world marine fishery resources. FAO Fisheries and Aquaculture Technical Paper No. 569. Rome, FAO. 2011. 334 pp, http://www.fao.org/3/i2389e/i2389e.pdf

270 This is required by the CFP and the MSFD. But these criteria are more ambitious in that they set concrete target reference points. References to support criteria: The Marine Strategy Framework Directive (MSFD) (2008/56/EC), under Descriptor 1 for determining GES, requires Member States to address the 'maintenance of biological diversity'. Subsequently, in order to assess whether Member States are achieving GES, Commission Decision 2017/8481 sets out the 'criteria and methodological standards on good environmental status of marine waters and specifications and standardised methods for monitoring and assessment....', including for the 'Criteria elements' of, respectively 'incidental bycatch' and 'population abundance'. Birdlife, Bycatch Mitigation FACT-SHEETS (Updated September 2014) Practical information on seabird bycatch mitigation measures; Birdlife, Bycatch Mitigation Practical information on seabird bycatch mitigation measures

1.2.1. **Bycatch should be minimised or eliminated** *Here the cumulative impacts of multiple fisheries on a population needs to be taken into account (by Implementation/enhancement of science-based measures as defined in fishery management plans to significantly reduce bycatch from the baseline.)* 1.2.2. **Mortality rates**: For birds: The threshold mortality rate from incidental seabird bycatch should be ≤1% of natural annual adult mortality of the species. For turtles: mandatory use of turtle excluding devices in areas where turtles are present For cetaceans: he threshold mortality rate from incidental seabird bycatch should be ≤1% of relevant sea basin population of the affected species. For other species: The threshold mortality rate from incidental catches of other marine mammals, sharks & rays should be close to non-existent with mandatory measures reducing mortality prohibiting wire leaders and shark lines in longline fisheries and other catch mitigation techniques, and minimum standards for safe handling and release. For sharks: a need to implement a “fins naturally attached” policy as the only method to ensure both proper catch accounting as well as compliance with shark retention measures. **1.2.3. Only truly selective methods / gear that has published research showing high selectivity and low impact on the ecosystem are used** **1.2.4. Release bycatch when species have known survival possibility.** This	hooks leaving the vessel and sinking beyond the diving range of foraging seabirds. In trawlers, mortality is categorised into two broad types: cable-relate mortality, including collisions with nets onde cables, warp cables and paravanes; and net-related mortality, which includes all deaths caused by nets entanglements. Mitigation measures must be designed to prevent contact between seabirds and gears. The period during which bait are available to birds is determined by the sink rate of the line, the diving ability of the bird species present and the use, or not, of seabird deterrents. Other incidental catches must be mitigated to ensure that fisheries do not harm any sensitive and endangered species and preserve the whole marine food web. On release of bycatch, a high percentage of deep sea species die when brought to the surface but mammals, birds, turtles, pelagic sharks etc can survive if hooks are removed and nets disentangled and they are put in the water fast enough. Two ASCOBANS resolutions were passed in 2000 (Resolution 3.3 on Incidental Take of Small Cetaceans) and 2006 (Resolution 5.5 on Incidental Take of Small Cetaceans), which refer to a maximum annual bycatch of 1.7% of the population size in that year and a precautionary limit for bycatch of less than 1% of the best available population estimate and the general aim to minimise bycatch (i.e., to ultimately reduce to zero).

especially applies to marine mammals (cetaceans, harbour purpose, etc)[271] **1.2.5. Report data through the EU catch registration system in place on control, under the data collection framework (or equivalent outside the EU)**[272] **1.2.6 Operating in a fishery that is fully documented with 100% observers' coverage (human or electronic).** Remote electronic monitoring to collect data is a plus	
2. Other species and habitat impacts^	
2.1 No take zones[273] **2.1.1. Fishing in a fishery with an established and maintained 10% no take zone**, prioritising sensitive habitats and ecosystem connectivity, EU Biodiversity Strategy requirements and the Nature Restoration Law. This should be evidenced in a fisheries management plan. **2.1.2. Restricting fishing areas in case of essential fish habitats (EFB) and sensitive habitats (SB), as assessed by STECF**	No take zone allows biodiversity to recover and encourage a spill over effect for the benefit of all including the fishers itself [e.g., World Heritage sites, critical breeding and nursery sites should be taken into account]. No take zone should cover at least 10% of our seas and be decided in consultation with stakeholders.
2.2 No wildlife persecution No killing, injury or harassment of competitors (seals etc)	In some areas fishers kill species perceived as competitors for fish or causing damage to nets (e.g., seals, dolphins, sharks etc). No killing of non-target species should be allowed when claiming SC to biodiversity.
2.3 No harm on marine or freshwater habitats[274]	Fishing gear can cause extreme damage to habitats such as coral reefs, oyster reefs, sea grass beds, kelp forests, marine phanerogams etc. Such damage can degrade habitats and can sometimes be irreversible on a human

271 This is as specified in the landing obligation regulation from the CFP (2013).

272 This aligns with CFP requirements

273 This goes beyond the requirements of the European Biodiversity strategy by defining 10% no take zone

274 This refers to the BHD as well as the MSFD while going a bit more ambitious by considering all seabed habitats

Habitats should be left undisturbed including sea beds and vulnerable marine ecosystems	lifespan scale. Operators must take care to avoid any such damage by refraining from the use of gear that can come into direct contact with sensitive habitats or has high risk of entanglement. Examples of harmful gear are bottom trawling, dredging, nets posed directly on reefs etc.
2.4. Minimise litter No discarded gear and minimised gear loss. All gear must have a tagging (ID), reporting, recovery and recycling, use of biodegradable materials and no single use equipment	Abandoned, lost or otherwise discarded fishing gear (ALDFG) represents a significant, yet ultimately unknown amount of global marine debris, with serious environmental and socioeconomic impacts.
3. Other^	
3.1 Bait sourcing No use of wild origin bait that is not itself extracted in a taxonomy compliant fishery.	Invasive species are capable of causing extinctions of native plants and animals, reducing biodiversity, competing with native organisms for limited resources, and altering habitats. This can result in huge economic impacts and fundamental disruptions of coastal and marine ecosystems.
3.2. Reporting **3.2.1. No record of illegal, unreported and unregulated (IUU) fishing activity in the last 5 years**[275] **3.2.2. 100% observers' coverage or Remote Electronic Monitoring (REM) is in place on board vessel to monitor compliance with harvesting criteria and better collection of data on by-catch**[276]	An operator engage in IUU fishing should not be considered for the taxonomy. Transparent and fully documented fisheries are key to ensure enforcement of policies. The need for remote electronic monitoring tools to better manage and avoid bycatch has proven success in some fisheries as it helps the data collection process.[277] Fully documented fisheries ensure transparency on bycatch reporting.

275 Aligns with CFP and IUU regulation

276 This is more ambitious than the current control regulation/CFP

277 http://www.iuuwatch.eu/wp-content/uploads/2019/06/Remote-Electronic-Monitoring.pdf; https://marinedevelopments.blog.gov.uk/2017/03/20/fully-documented-fishery-discards-quota-fish-cctv/; https://www.nature.org/magazine/archives/counting-on-fish.xml?src=social.nature.facebook.main; https://www.wwf.org.uk/sites/default/files/2017-10/Remote%20Electronic%20Monitoring%20in%20UK%20Fisheries%20Management_WWF.pdf

	Remote electronic monitoring Improves compliance and transparency. An example from Denmark based on the opinion of fishery inspectors to REM was investigated. 80% of Danish fishery inspectors expressed positive views on REM, with 63% of them confirming its potential for full documentation and compliance with the CFP's Landing Obligation.[278]
3.3 No Discards or high-grading[279]	Unwanted catches and discards constitute a substantial waste and negatively affect the sustainable exploitation of marine biological resources and marine ecosystems and the financial viability of fisheries.

Do no significant harm ('DNSH')

(1) Climate change mitigation	For vessels with freezing/refrigeration facilities on board: • Phase out of CFCs and HCFCs in compliance with the Montreal and Kigali Protocols • Where processing onboard, compliance with the F-gas Regulation (EU) No 517/2014: banning the use of Fluorinated GHGs (F-gases) including hydrofluorocarbons (HFCs)
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852.

278 Plet-Hansen et al., 2016ahttps://doi.org/10.1016/j.marpol.2016.11.028

279 This aligns with the CFP.

(3) Sustainable use and protection of water and marine resources	DNSH as set out in Appending B of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852.
(4) transition to a circular economy	N/A
(5) Pollution prevention and control	To be determined

Rationale

The scope of activities selected

As the pressures on biodiversity and ecosystems from freshwater fishing are very similar to those for marine fishing, both of these commercial catch fishing activities are covered by these criteria.[280] Likewise, as recreational and sport fishing can also contribute to those same pressures, those activities are also covered by these criteria. This is not to imply that in aggregate recreational and sport fishing puts as much pressure on biodiversity and ecosystems as commercial catch fishing, but in recognition that particular instances of these activities can cause significant pressures, and also that in some EU countries recreational and sport fishing is bigger than commercial catch fishing.

Fishing activities in general means "searching for fish, shooting, setting, towing, hauling of a fishing gear, taking catch on board, trans-shipping, retaining on board, processing on board, transferring, caging, fattening and landing of fish and fishery products" as per the Common

280 As recognized under the Common Fisheries Policy (CFP) (EC, 2013): Recreational fisheries can have a significant impact on fish resources and Member States should, therefore, ensure that they are conducted in a manner that is compatible with the objectives of the CFP.

Fisheries Policy. Marine biological resources' means available and accessible living marine aquatic species, including anadromous and catadromous species during their marine life, and 'fresh water biological resources' means available and accessible living freshwater aquatic species.

In essence, the rule-of-thumb on boundaries for ‘fishing’ as described above is what happens at sea/ on water, or more technically by the fishing vessel.

Aquaculture (marine and freshwater) should be addressed in the Taxonomy due to the significant negative environmental impacts of some aquaculture activities and positive impacts of some other aquaculture activities (e.g., mussel farming) as well as huge scope for innovation and improvement. However, given that issues in aquaculture are significantly different to those in fishing, it would not be a simple case of carrying over criteria from fishing to aquaculture. Therefore, aquaculture is not covered by these criteria. It is strongly recommended, however, that aquaculture is prioritised in the next round.

The establishment, maintenance or restoration of protected areas are covered under the activities ‘Conservation of Habitats and Ecosystems’ or ‘Restoration of Ecosystems’. These activities include the conservation of ecosystems, habitats and/or the maintenance and recovery of viable populations of species in their natural surroundings (in-situ conservation). This could be achieved by means of protected areas or other effective area-based conservation measures into wider land- and seascapes (conservation) and the re-creation of an ecosystem ex-novo (restoration).

Capturing a substantial contribution

Fishing is an extractive activity. It can be performed in such a way that it is “low impact” through the use of fishing gear and fishing behaviour that avoid targeting threatened species, avoid by-catch[281] and avoid damage to habitats. “Low impact fishing” reduces the direct pressures on biodiversity and ecosystems. However, further practices (e.g. no-take zones) can be

281 According to the OECD, by-catch is the fish or other fauna (e.g. birds or marine mammals) that are caught during fishing, but which are not sold or kept for personal use. In commercial fishing these include both fish discarded for economic reasons (economic discards) and because regulations require it (regulatory discards). Fish released alive under catch-and-release fishery management programs are not normally considered as bycatch. In the EU, under the landing obligation, fish regulated under quota or minimum reference size cannot longer be discarded unless a high survival of the species is proved.

established at the ecosystem level to reduce extractive pressures further, which then enable the recovery and restoration of biodiversity and habitats. For example, “no-take zones”.

Extraction volumes (catches) should be in line with the maximum sustainable yield (MSY) rates, as advised by the best available scientific advice that account for leaving sufficient biomass levels of each stock to provide sustainable food for human consumption, and food for predators (e.g. fish-eating seabirds, marine mammals, reptiles, elasmobranchs). These measures need to be set and managed at the ecosystem level. An individual fisher that operates within these ‘ecosystem boundaries’ is making an important contribution to the recovery and restoration of overall fish stocks, other biodiversity, their habitats and the marine ecosystem as a whole.

With this in mind, these criteria deem that fishing is making a substantial contribution to the protection and restoration of ecosystems when the activity:

- Is ‘low-impact’; *and*
- Is carried out within the limits set at ecosystem level to enable the recovery and restoration of fish stocks, other marine species making up marine biodiversity and their habitats.

This level of ambition, and the associated criteria per Table 1, are consistent with the following:

- The Common Fishery Policy (CFP) (2013) which determine the following key objectives:
  - Fishing is environmentally sustainable in the long-term.
  - Fishing applies the precautionary approach to fisheries management, and shall aim to ensure that exploitation of living marine biological resources restores and maintains populations of harvested species above levels which can produce the maximum sustainable yield
  - Fishing must implement the ecosystem-based approach to fisheries management so as to ensure that negative impacts of fishing activities on the marine ecosystem are minimised and shall endeavour to ensure that aquaculture and fisheries activities avoid the degradation of the marine environment.

- According to Article 7 of the CFP in particular: “Measures for the conservation and sustainable exploitation of marine biological resources may include, inter alia, the following:

(a) multiannual plans under Articles 9 and 10;

(b) targets for the conservation and sustainable exploitation of stocks and related measures to minimise the impact of fishing on the marine environment;

(c) measures to adapt the fishing capacity of fishing vessels to available fishing opportunities;

(d) incentives, including those of an economic nature, such as fishing opportunities, to promote fishing methods that contribute to more selective fishing, to the avoidance and reduction, as far as possible, of unwanted catches, and to fishing with low impact on the marine ecosystem and fishery resources;

(e) measures on the fixing and allocation of fishing opportunities;

(f) measures to achieve the objectives of Article 15;

(g) minimum conservation reference sizes;

(h) pilot projects on alternative types of fishing management techniques and on gears that increase selectivity or that minimise the negative impact of fishing activities on the marine environment;

(i) measures necessary for compliance with obligations under Union environmental legislation adopted pursuant to Article 11;

(j) technical measures as referred to in paragraph 2.

- The EU Birds and Habitats Directives which aim to achieve favourable conservation status for listed species (likewise a host of international agreements which address favourable conservation status.[282]
- The EU Biodiversity Strategy which has key commitments that by 2030:

282 e.g. for seabirds https://www.acap.aq/fr/ ; cetaceans https://www.cms.int/raptors/sites/default/files/instrument/Anglais_Text%20of%20the%20Agreement%20English.pdf, IUCN (best available science) and CITES: https://cites.org/eng/disc/species.php)

- "… habitats and species show no deterioration in conservation trends and status; and at least 30% reach favourable conservation status or at least show a positive trend";
- "Achieving good environmental status of marine ecosystems, including through strictly protected areas, must involve the restoration of carbon-rich ecosystems as well as important fish spawning and nursery areas";
- "Marine resources must be harvested sustainably and there must be zero-tolerance for illegal practices";
- "Healthy fish stocks are key to the long-term prosperity of fishermen and the health of our oceans and biodiversity. This makes it all the more important to maintain or reduce fishing mortality at or under Maximum Sustainable Yield levels."

- The Marine Strategy Framework Directive (MSFD) Article 1, which determines that to achieve 'good environmental status (GES)' it is necessary that:
  - Fisheries contribute to the favourable conservation status (FCS) defined in the Birds and Habitats Directive and do not harm any sensitive and endangered species;
  - Fisheries are managed and performed in a way that cannot limit the achievement of GES for the marine ecosystem. Full selectivity should be reached;
  - There is a switch from high to low impact fisheries;
  - Fisheries have significant reduced impacts on the ecosystem.

- The EU-Water Framework Directive (EU-WFD) which has the key commitment to achieve a "good ecological status (GES)" or "good ecological potential (GEP)" for rivers, lakes, transitional waters, and coastal waters based on biological quality elements including the fish fauna (species composition, age structure) as a core indicator. The ecological status or potential for surface water bodies (SWBs) is categorized in the EU-WFD regime as high, good, moderate, poor, or bad applying a 'one out, all out' principle by the biological quality element which has received the worst rating. Fisheries therefore interfere significantly with the achievement of the EU-WFD objectives and contribute to the health of freshwater ecosystems reaching GES or GEP.

Approach to setting the criteria

All types of fishing (marine or freshwater fishing for commercial, sport or recreational purposes) are addressed in the one set of criteria as there is significant consistency across all these

activities. When any aspect of the criteria relates to only a subset of these fishing activities, this is specified directly in the criteria in Table 1 itself, otherwise we consider that the criterion applies to all type of fishing activities.

Table 1 describes a 'bundle' of criteria. Some of these criteria are described in qualitative terms, some have quantitative thresholds. Preference has been given to the inclusion of quantitative thresholds where available, with supporting scientific evidence provided.

Criteria marked with a '^' represent safeguard levels of performance. Non marked criteria go above and beyond safeguards. Some address requirements for "low-impact' fishing. Some address ecosystem constraints to enable ecosystem recovery. All criteria in Table 1 must be met unless explicitly noted otherwise. Together, as a bundle, compliance with these criteria would demonstrate a substantial contribution to the protection and restoration of biodiversity and ecosystems.

Because of this need to address the impacts of fishing on biodiversity and habitats at the ecosystem level, and because most fishing is regulated in established "fisheries" (and so most operators are already bound by ecosystem set or managed standards), many of these practices should and could be assessed at the fishery level. Therefore, many activities might be able to show taxonomy alignment simply by being regulated under a taxonomy compliant fishery, with some additional activity-specific requirements.

The intention has been to set globally relevant criteria, addressing pressures in fishing that might be more prevalent within the EU and/ or in other locations globally. To assist their global use, base criteria have been set which are not reliant on local regulations or standards, that can be interpreted in all locations and contexts globally, and use globally recognized terminology. Once these criteria are established, then existing regulations or legislation, or labelling or certification schemes used in the industry can be evaluated for equivalence with these base criteria. Where equivalent, that regulation, scheme or other would then represent an established 'proxy indicator' for all or part of these criteria, increasing the usability of the criteria. This process has been started here, with cross reference to EU regulations where appropriate, including but not limited to, the Common Fisheries Policy.

2. Manufacturing

Among manufacturing activities, a set of seven enabling activities were developed by the PSF members. The approach for defining the technical screening criteria for the enabling activities and for defining their scope is divided into two types:

- Specific enabling activities: Manufacture of machinery enabling closed-loop systems, and high-quality waste collection and waste management; Manufacture of high, medium and low voltage electrical equipment that result in or enable substantial GHG emissions reductions. These activities are defined as direct enablers by the nature of the activity itself as it was the approach taken in the climate DA.
- Horizontal enabling activities: Manufacture of machinery, equipment and solutions enabling a substantial contribution to the circular economy; Manufacture of machinery, equipment and solutions enabling a substantial contribution to the pollution prevention and control; Manufacture of machinery, equipment and solutions enabling a substantial contribution the sustainable use and protection of water and marine resources. The aim of this approach is to capture all the direct enablers with potential existing solutions that are not included as specific enabling activities because of the difficulty to define all of them. Those horizontal enabling activities need to have specific safeguards in order to prove that the activity directly enables to another taxonomy aligned activity and that is materially enabling the other activity to make a substantial contribution. This is a new approach that was not used in the climate DA, therefore there is not a clear methodology yet on how to robustly address those enabling activities. Therefore, we would like to ask specifically for feedback in order to improve the technical screening suggested for these activities and to make it more robust and science based.

2.1 Manufacture of basic pharmaceutical products

Description of the activity

Manufacture of basic pharmaceutical products, also known as Active Pharmaceutical Ingredients (APIs).

The activity is classified under NACE code C21.1 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.Technical screening criteria

Substantial contribution to pollution prevention and control
The activity has to comply with both A and B sets of technical criteria. A. The API has to comply with the next two requirements (A1 and A2): A1. Analysed by the test methods from 301 described in the OECD guideline for testing of chemicals (OECD, 1992)[283], the API and its metabolites[284]: o For at least one of the test methods from 301, are classified as readily biodegradable in accordance with the pass value for ready biodegradability define in the mentioned OECD guideline. o Show ultimate biodegradation of at least 70% DOC (Dissolved organic carbon). A2. Equivalent or better pharmacological properties than other API available in the market that does not comply with the above requirements described in A1[285]. B. Next five requirements related to the production process (B1, B2, B3, B4 and B5) have to be complied with: B1. Where applicable, the operator has to demonstrate emission levels below the mid-point of the BAT-AEL ranges[286] set out in:

[283] OECD 301 (301A-F) studies are used to identify substances which are assumed to rapidly and ultimately biodegrade under aerobic environmental conditions, i.e. mineralised).

[284] The identification of the metabolites that are likely to be excreted in the environment must be based on the study of the bioactivation pathway of pharmaceuticals.

[285] It must be proved with an Analysis to be published and verified by an independent third party.

[286] The requirements under B1 shall tackle the pollutants identified under the key environmental issues of each BREF document or the BAT-AEL of the relevant BAT conclusions Commission Implementing Decisions. Where BAT-AEL differentiate between “existing” and “new plants”, operators have to demonstrate compliance with BAT-AEL for new plants. When there is not a BAT-AEL range but a single value, emission levels have to be below such value. When the BAT-AEL range is expressed as follows: “<x-y unit” (I.e. the lower-end BAT-AEL of the range is expressed as ‘lower than’), the mid-point will be calculated using x and y. Averaging periods have to be the same as in the BAT-AEL of the BREF documents outlined above. JRC (2019) BAT conclusions chapter in the formal draft of the Best Available Techniques (BAT) Reference Document for Common Waste Gas Management and Treatment Systems in the Chemical Sector. Joint Research Centre. Directorate B – Growth

a) The current Best Available Techniques Reference Document (BREF) for Manufacture of Organic Fine Chemicals;

b) The best available techniques (BAT) conclusions for common wastewater and waste gas treatment/management systems in the chemical sector;

c) The current Best Available Techniques Reference Document (BREF) for the production of speciality inorganic chemicals;

d) The best available techniques (BAT) conclusions for common waste gas management and treatment systems in the chemical sector taking the formal draft of the WCG BREF into account [287].

No significant cross-media effects occur.

B2. The operator has to apply Continuous Emission Monitoring Systems (CEMS) and Continuous Effluent Quality Monitoring Systems (CEQMS).

B3. Solvent waste segregation for solvent recovery from concentrated waste streams. Solvents included in Table 1 of ICH guideline Q3C (R6) on impurities: guideline for residual solvents (EMA,2019) have to be avoided in pharmaceutical products. Solvent waste segregation for solvent recovery from concentrated waste streams – when applicable. The maximum solvents loss from total inputs cannot not exceed 3%. Total volatile organic compound (TVOC) recovery efficiency has to be at least 99%. The operator has to verify that no diffuse emission occurs by carrying out Leak detection and repair (LDAR) campaigns, at least every 3 years. Such LDAR campaigns shall have the features described in BAT19 of the WCG BREF

B4. Sewage, refuse, and other waste (e.g., solids, liquids, or gaseous by-products from manufacturing) should be disposed of in a safe, timely, and sanitary manner. Containers and/or pipes for waste material should be clearly identified. Analytical data demonstrating the conversion of these substances and their residues to non-hazardous waste materials have to be available at the facility and kept up to date.

and Innovation Circular Economy and Industrial Leadership Unit. European IPPC Bureau. https://eippcb.jrc.ec.europa.eu/sites/default/files/2019-12/WGC_D1.pdf

[287] When the BAT-AEL range is expressed as follows: "<x-y unit" (I.e. the lower-end BAT-AEL of the range is expressed as 'lower than'), the mid-point will be calculated using x and y.

B5. The production process does not include intentionally added substances that meet the criteria of Substances of Very High Concern (i.e., substances that meet the criteria laid down in Article 57 of Regulation (EC) 1907/2006) Do no significant harm ('DNSH')

Do no significant harm ('DNSH')	
(1) Climate change mitigation	Greenhouse gas emissions tCO2e per tonne of product (Calculated in accordance with Regulation (EU) 2019/331) from the production process are lower than the median[288] value of the data collected in the context of establishing the EU ETS (Emissions Trading Scheme) industrial benchmarks for the period of 2016-2017.
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852.
(3) Sustainable use and protection of water and marine resources	All three water criteria have to be applied (W1, W2 and W3) W1. Waste water treatment: Elimination (until limit of detection according to current scientific standards) of the API. And, for the rest of substances, the activity has to meet the requirements of The activity has to meet the requirements of - Urban Wastewater Treatment Directive (91/271/EEC), - Directive 2008/105/EC on Environmental Quality Standards, amended by 2013/39/EU),

[288] The average will be calculated for the production of the amount of each API with equivalent pharmaceutical properties, identified in the Analysis undertaken to prove compliance with A.2 than 1 tonne of product under assessment.

	- Groundwater directive 2006/118/EC - Industrial Emissions Directive (2010/75/EU), - Water Framework Directive (2000/60/EC), - Drinking Water Directive (2020/2184) INDUS - Bathing Water Directive (76/160/EEC) - JRC Best Environmental Management Practice for the Public Administration Sector. 2019 - Marine Strategy Framework Directive (MSFD) 2008/56/EU - Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment The good conditions of waters in the Directives and guidelines listed above have to be achieved by appropriate technical installations at the manufacturing plant. Waste water treatment processes must not lead to any deterioration of water bodies and marine resources. W2. Soil and groundwater protection: Inclusion of appropriate measures to prevent emissions to soil and regular surveillance of those measures to avoid leaks, spills, incidents or accidents occurring during the use of equipment and during storage. W3. Water Consumption: Manufacturers have to assess the water footprint of the operations according to ISO 14046 and ensure that they do not contribute to water scarcity.
(4) Transition to a circular economy	N/A

(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appending D of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852

Rationale

According to the EU Strategic Approach to Pharmaceuticals in the Environment (2019), the largest source, or “hotspot”, of pharmaceuticals entering the environment is use. The chemical and/or metabolic stability of some pharmaceuticals means that up to 90% of the active ingredient is excreted (or washed off) in its original form. This is the reason that the manufacture of sustainable APIs, with a lower risk for the environment, was considered as an activity with a high potential for substantial contribution.

Substantial Contribution

The extension of the concept of inherently safe APIs to sustainability results in a new requirement that chemicals should be completely and readily degraded to harmless products, i.e. that they are fully mineralized within a reasonable time on entering the environment. Conventional wisdom assumes that an API needs to be stable to be successful in the market […] this is not necessarily the case […] there are lots of examples demonstrating that good performance of an API is not necessarily in contradiction with good biodegradability in the environment as some readily biodegradable APIs demonstrate (Table 7.1, Green and Sustainable Medicinal Chemistry: Methods, Tools and Strategies for the 21st Century Pharmaceutical Industry, Royal Society of Chemistry, 2016).

Section A:

A1 Pharmaceutical industry are fully familiar with the OECD proposed methodology and its thresholds, using them in their Environmental Risk Assessments.

A2 The production of biodegradable APIs can only be regarded as a substantial contribution to pollution prevention and control when the substances are replacing those no-biodegradable.

Section B:

Prevention and control of pollution at plan are needed, especially for those plants outside the Union.

B1 The EU BAT Reference Documents (BREF) from the European Commission establish a chapter on BAT conclusions with BAT-AEL (typically an emission concentration range) that Competent Authorities need to use to approve environmental permit conditions for operators of IED installations.

Where applicable, the operator must demonstrate emission levels below the mid-point of the BAT-AEL ranges set out in the BREF documents outlined in B1 above.

Noting that the focus of sustainable contribution for this activity is on prevention and substitution of hazardous substances (according with the list above), emission levels need to remain equivalent to what is expected of state-of-the-art installations, as per the available information collected during the BREF process. As such, the rationale here has been to require operators to demonstrate emission levels that are at or below the midpoint of the BAT-AEL range. When there is a distinction between existing or new plants, emission levels have to be equivalent to those of new plants. When there is not a BAT-AEL range but a single value, emission levels have to be below such value. https://eippcb.jrc.ec.europa.eu/reference/

B3 The WGC BREF is in about to be finalized. The maximum solvent loss proposed currently is set to <5% (BAT 23, Table 4.7). However, 21 out of 28 reference plants are already well below the level of 5%. Therefore, a level of ambition is proposed, set to 3% max.

B4 EudraLex - The Rules Governing Medicinal Products in the European Union, Volume 4, Good Manufacturing Practice (GMP) Medicinal Products for Human and Veterinary Use, Part II: Basic Requirements for Active Substances used as Starting Materials. The European Medicine Agency has a coordinating role for GMP inspections of manufacturing sites for medicines whose marketing authorization in the EU is submitted through the centralized procedure or as part of a referral procedure.

EMA chairs and provides the secretariat for the GMP/GDP Inspectors Working Group of senior inspectors appointed by all the EEA competent authorities.

DNSH:

Alignment with those defined for similar activities such a Manufacture of Chemicals and Manufacture of Chemical Products (NACE Code C20)

2.2 Manufacture of basic pharmaceutical preparations

Description of the activity

Manufacture of pharmaceutical preparations, including dosing and distribution considerations. Only pharmaceutical preparations evaluated by EMA and authorised by the European Commission in order to be marketed in the EU are eligible.

The activity is classified under NACE code C21.2 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

Substantial contribution to pollution prevention and control
The activity hast to comply with one of the following technical criteria (A or B). Additionally, set C of criteria has to be complied in any case. A. The pharmaceutical preparation has to comply with the next three requirement (A1, A2 and A3): A1. The used APIs have to comply with the screening criteria defined for Manufacture of Basic Pharmaceutical Products (NACE Code C21.1) for Pollution Prevention and Control. A2. The manufacture process should not reduce the API capacity for its environmental mineralization. A3. Equivalent or better pharmacological properties than other preparation available in the market containing APIs that do not comply with the screening criteria defined Manufacture of Basic Pharmaceutical Products (NACE Code C21.1) for Pollution Prevention and Control[289]. B. When there is no API which complies with the screening criteria defined for Manufacture of Basic Pharmaceutical Products (NACE Code C21.1) for Pollution Prevention and Control

[289] It must be proved with an Analysis to be published and verified by an independent third party.

available for the manufacturing of the preparation, then, next six requirements (B1, B2, B3, B4, B5 and B6) have to be complied with:

B1. The manufacturer has to prove with an Analysis to be published and verified by an independent third party that there is no such alternative.

B2. The concentration of APIs in effluents has to ensure ratios PEC/PNEC[290] lower than 1. This ratio has to be obtained through an Environmental Risk Assessment for the full life cycle of the product, according to EMA (European Medicines Agency) guidelines or equivalent, to be published and verified by an independent third party.

B3. Packaging and distribution system allow to adjust the sold amount to the required amount by the treatment/s.

B4. Public information, updated according with the state of the art, is provided about dose and dosing method to minimize the excess of dosed API.

B.5 Packaging and distribution system allow to use the most efficient dosing system available according to the estate of the art and considering the kind of administration (e.g. by health care professionals or domestic). The manufacturer has to prove with an Analysis to be published and verified by an independent third party.

B.6 Implementation/adhesion to a take-back scheme of unused pharmaceuticals.

NOTE (2): PEC = predicted environmental concentration; PNEC = predicted no effect concentration

C. Next five requirements (C1, C2, C3, C4 and C5) have to be complied with in any case:

C1. Where applicable, the operator has to demonstrate emission levels below the mid-point of the BAT-AEL ranges[291] set out in:

[290] PEC = predicted environmental concentration; PNEC = predicted no effect concentration

[291] The requirements under C1 shall tackle the pollutants identified under the key environmental issues of each BREF document or the BAT-AEL of the relevant BAT conclusions Commission Implementing Decisions. Where BAT-AEL differentiate between “existing” and “new plants”, operators have to demonstrate compliance with BAT-AEL for new plants. When there is not a BAT-AEL range but a single value, emission levels have to be below

a) the current Best Available Techniques Reference Document (BREF) for Manufacture of Organic Fine Chemicals- Solids and Others industry;

b) the best available techniques (BAT) conclusions for common wastewater and waste gas treatment/management systems in the chemical sector;

c) the current Best Available Techniques Reference Document (BREF) for the production of specialty inorganic chemicals;

d) the best available techniques (BAT) conclusions for common waste gas management and treatment systems in the chemical sector taking the formal draft of the WCG BREF into account[292].

No significant cross-media effects occur.

C2. Continuous Emission Monitoring Systems (CEMS) and Continuous Effluent Quality Monitoring Systems (CEQMS)

C3. Solvent waste segregation for solvent recovery from concentrated waste streams. Solvents included in Table 1 of ICH guideline Q3C (R6) on impurities: guideline for residual solvents (EMA,2019) have to be avoided in pharmaceutical products. Solvent waste segregation for solvent recovery from concentrated waste streams – when applicable. The maximum solvents loss from total inputs cannot not exceed 3%. Total volatile organic compound (TVOC) recovery efficiency has to be at least 99%. The operator has to verify that no diffuse emission occurs by carrying out Leak detection and repair (LDAR) campaigns, at least every 3 years. Such LDAR campaigns shall have the features described in BAT19 of the WCG BREF[293].

such value. When the BAT-AEL range is expressed as follows: "<x-y unit" (I.e. the lower-end BAT-AEL of the range is expressed as 'lower than'), the mid-point will be calculated using x and y. Averaging periods have to be the same as in the BAT-AEL of the BREF documents outlined above. JRC (2019) BAT conclusions chapter in the formal draft of the Best Available Techniques (BAT) Reference Document for Common Waste Gas Management and Treatment Systems in the Chemical Sector. Joint Research Centre. Directorate B – Growth and Innovation Circular Economy and Industrial Leadership Unit. European IPPC Bureau. https://eippcb.jrc.ec.europa.eu/sites/default/files/2019-12/WGC_D1.pdf

[292] When the BAT-AEL range is expressed as follows: "<x-y unit" (I.e. the lower-end BAT-AEL of the range is expressed as 'lower than'), the mid-point will be calculated using x and y.

[293] The requirements under C1 shall tackle the pollutants identified under the key environmental issues of each BREF document or the BAT-AEL of the relevant BAT conclusions Commission Implementing Decisions.

	C4. Sewage, refuse, and other waste (e.g., solids, liquids, or gaseous by-products from manufacturing) should be disposed of in a safe, timely, and sanitary manner. Containers and/or pipes for waste material should be clearly identified. Analytical data demonstrating the conversion of these substances and their residues to non-hazardous waste materials have to be available at the facility and kept up to date. C5. The production process does not include intentionally added substances that meet the criteria of Substances of Very High Concern (i.e., substances that meet the criteria laid down in Article 57 of Regulation (EC) 1907/2006)
Do no significant harm ('DNSH')	
(1) Climate change mitigation	Greenhouse gas emissions tCO2e per tonne of product (Calculated in accordance with Regulation (EU) 2019/331) from the production process are lower than the median value[294] of the data collected in the context of establishing the EU ETS (Emissions Trading Scheme) industrial benchmarks for the period of 2016-2017.
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852.
(3) Sustainable use and protection of water and marine resources	All three water criteria have to be applied (W1, W2 and W3) W1. Waste water treatment: Elimination (until limit of detection according to current scientific standards) of the APIs. And, for the rest of substances, the activity has to meet the requirements of

[294] The average will be calculated for the production of the amount of each preparation with equivalent pharmaceutical properties identified in the Analysis undertaken to prove compliance with A.2 than 1 tonne of the preparation under assessment.

	The activity has to meet the requirements of - Urban Wastewater Treatment Directive (91/271/EEC), - Directive 2008/105/EC on Environmental Quality Standards, amended by 2013/39/EU), - Groundwater directive 2006/118/EC - Industrial Emissions Directive (2010/75/EU), - Water Framework Directive (2000/60/EC), - Drinking Water Directive (2020/2184) INDUS - Bathing Water Directive (76/160/EEC) - JRC Best Environmental Management Practice for the Public Administration Sector. 2019 - Marine Strategy Framework Directive (MSFD) 2008/56/EU - Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment The good conditions of waters in the Directives and guidelines listed above have to be achieved by appropriate technical installations at the manufacturing plant. Waste water treatment processes must not lead to any deterioration of water bodies and marine resources. W2. Soil and groundwater protection: Inclusion of appropriate measures to prevent emissions to soil and regular surveillance of those measures to avoid leaks, spills, incidents or accidents occurring during the use of equipment and during storage. W3. Water Consumption: Manufacturers have to assess the water footprint of the operations according to ISO 14046 and ensure that they do not contribute to water scarcity.

(4) Transition to a circular economy	N/A
(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appending D of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852.

Rationale

According to the EU Strategic Approach to Pharmaceuticals in the Environment (2019), the largest source, or “hotspot”, of pharmaceuticals entering the environment is use. The chemical and/or metabolic stability of some pharmaceuticals means that up to 90% of the active ingredient is excreted (or washed off) in its original form.

Currently, the availability of sustainable APIs (as defined for NACE Code C21.1), with a low risk for the environment, is limited and, for this reason, the manufacture of pharmaceutical preparation, including dosing and distribution considerations, was considered as an activity with a high potential for substantial contribution due its capacity on reducing the amount of APIs released to the environment during and after the use stage of the life cycle of the pharmaceutical products.

Rationale for substantial contribution

Section A:

Alignment with SC defined for Manufacture of Basic Pharmaceutical Products (NACE Code C21.1) for Pollution Prevention and Control.

Section B:

Alignment with the EU Strategic Approach to Pharmaceuticals in the Environment.

Section C:

See rationale for section B of the SC defined for Manufacture of Basic Pharmaceutical Products (NACE Code C21.1) for Pollution Prevention and Control.

DNSH

See rationale for DNSH defined for Manufacture of Basic Pharmaceutical Products (NACE Code C21.1) for Pollution Prevention and Control

2.3 Manufacture of chemicals

Description of the activity

Manufacture of chemicals - Activities classified under NACE code C20 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006 and which products consist in a single substance with CAS as an identity

Substantial contribution to pollution prevention and control
The aim is to produce safe alternatives to priority hazardous substances in safer process conditions to reduce pollution. This means the activity has to comply with all sets of technical criteria (see visual in the rationale). A. The produced substance is not fulfilling any hazardous properties specified in the list of Substances of Concern included below and B. The production process does not intentionally use any substance that meet the criteria of Substances of Very High Concern (i.e., substances that meet the criteria laid down in Article 57 of Regulation (EC) 1907/2006) and C. The produced substance is used as a substitute of a substance of concern. Therefore, the operator has to demonstrate that an equivalent substance with comparable functionality, fulfilling any hazardous properties in the list of Substances of Concern, is currently produced[295]. And

[295] It has to be proved with an Analysis to be published and verified by an independent third party.

D. The activity has to comply with requirement D1, D2 and D3 regarding emission at the facility.

D1. Where applicable, the operator has to demonstrate emission levels below the mid-point of the BAT-AEL ranges[296] set out in:

a) The current Best Available Techniques Reference Document (BREF) for the large volume inorganic chemicals- Solids and others industry.

b) The current Best Available Techniques Reference Document (BREF) for large volume inorganic chemicals – Ammonia, acids and fertilizers.

c) The best available techniques (BAT) conclusions for common wastewater and waste gas treatment/management systems in the chemical sector.

d) The best available techniques (BAT) conclusions for common waste gas management and treatment systems in the chemical sector taking the formal draft of the WCG BREF into account[297].

e) The best available techniques (BAT) conclusions for the production of chlor-alkali.

f) The best available techniques (BAT) conclusions for large volume organic chemicals.

No significant cross-media effects occur.

[296] The requirements under D1 shall tackle the pollutants identified under the key environmental issues of each BREF document or the BAT-AEL of the relevant BAT conclusions Commission Implementing Decisions. Where BAT-AEL differentiate between “existing” and “new plants”, operators have to demonstrate compliance with BAT-AEL for new plants. When there is not a BAT-AEL range but a single value, emission levels have to be below such value. When the BAT-AEL range is expressed as follows: “<x-y unit” (I.e. the lower-end BAT-AEL of the range is expressed as ‘lower than’), the mid-point will be calculated using x and y. Averaging periods have to be the same as in the BAT-AEL of the BREF documents outlined above. JRC (2019) BAT conclusions chapter in the formal draft of the Best Available Techniques (BAT) Reference Document for Common Waste Gas Management and Treatment Systems in the Chemical Sector. Joint Research Centre. Directorate B – Growth and Innovation Circular Economy and Industrial Leadership Unit. European IPPC Bureau. https://eippcb.jrc.ec.europa.eu/sites/default/files/2019-12/WGC_D1.pdf

[297] The requirements under D1 shall tackle the pollutants identified under the key environmental issues of each BREF document or the BAT-AEL of the relevant BAT conclusions Commission Implementing Decisions.

D2. The operator has to apply Continuous Emission Monitoring Systems (CEMS) and Continuous Effluent Quality Monitoring Systems (CEQMS) including soil- and groundwater - when applicable.

D3. The operator has to apply solvent waste segregation for solvent recovery from concentrated waste streams – when applicable. The maximum solvents loss from total inputs cannot exceed 3%. Total volatile organic compound (TVOC) recovery efficiency has to be at least 99%. The operator has to verify that no diffuse emission occurs by carrying out Leak detection and repair (LDAR) campaigns, at least every 3 years. Such LDAR campaigns shall have the features described in BAT19 of the WCG BREF[298].

List of Substances of Concern

a. Known & presumed carcinogenicity (Cat. 1A & 1B) (CLP H350)

b. Known & presumed germ cell mutagenicity (Cat. 1A & 1B) (CLP H340)

c. Known & presumed reproductive toxicity (Cat. 1A & 1B) (CLP H360)

d. Persistent, Bioacumulative, Toxic (PBTs), or very Persistent very Bioaccumulative (vPvBs) (according to the criteria in Annex XIII of REACH)

e. Substances of equivalent level of concern (ELoC, including some Endocrine disruptors, respiratory sensitizers, immunotoxic and neurotoxic substances; i.e. substances meeting the criteria laid down in Article 57f of Regulation (EC) 1907/2006 and identified in accordance with Article 59(1) of that Regulation)

f. Persistent, Mobile and Toxic (PMT), or very Persistent very Mobile vPvM (when criteria are developed and included in the CLP Regulation)

g. Endocrine disrupting properties (substances meeting the criteria for endocrine disruptors under the plant protection product or biocidal product regulation or the criteria under the CLP regulation, when available)

h. Respiratory sensitizers Cat. 1 (CLP H334)

i. Specific Target Organ Toxicity - Single Exposure Cat. 1 & 2 (CLP H370 & H371)

[298] Where BAT-AEL differentiate between “existing” and “new plants”, operators have to demonstrate compliance with BAT-AEL for new plants.

j.	Specific Target Organ Toxicity - Repeated Exposure Cat. 1 & 2 (CLP H372 & 373)
k.	Hazardous to ozone layer (CLP H420)
l.	Chronic hazard to the aquatic environment Cat. 1, 2, 3 & 4 (CLP H410-413)
m.	Skin sensitizers Cat. 1 (CLP H317)
n.	Suspected carcinogenicity (Cat. 2) (H351)
o.	Suspected germ cell mutagenicity (Cat. 2) (H341)
p.	Suspected reproductive toxicity (Cat. 2) (H361)

Do no significant harm ('DNSH')

(1) Climate change mitigation	Greenhouse gas emissions tCO2e per tonne of product (Calculated in accordance with Regulation (EU) 2019/331) from the production process are lower than the median value[299] of the data collected in the context of establishing the EU ETS (Emissions Trading Scheme) industrial benchmarks for the period of 2016-2017.
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852.
(3) Sustainable use and protection of water and marine resources	All three water criteria have to be applied (W1, W2 and W3) W1. Waste water treatment: Elimination (until limit of detection according to current scientific standards) of the API. And, for the rest of substances, the activity has to meet the requirements of

[299] When compliance with A3.2 or A3.3 is claimed, the average will be calculated accounting the production of the amount of each chemical, identified in the Analysis undertaken to prove that compliance, with equivalent properties than 1 tonne of the produced chemical substance under assessment.

	The activity has to meet the requirements of - Urban Wastewater Treatment Directive (91/271/EEC), - Directive 2008/105/EC on Environmental Quality Standards, amended by 2013/39/EU), - Groundwater directive 2006/118/EC - Industrial Emissions Directive (2010/75/EU), - Water Framework Directive (2000/60/EC), - Drinking Water Directive (2020/2184) INDUS - Bathing Water Directive (76/160/EEC) - JRC Best Environmental Management Practice for the Public Administration Sector. 2019 - Marine Strategy Framework Directive (MSFD) 2008/56/EU - Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment The good conditions of waters in the Directives and guidelines listed above have to be achieved by appropriate technical installations at the manufacturing plant. Waste water treatment processes must not lead to any deterioration of water bodies and marine resources. W2. Soil and groundwater protection: Inclusion of appropriate measures to prevent emissions to soil and regular surveillance of those measures to avoid leaks, spills, incidents or accidents occurring during the use of equipment and during storage. W3. Water Consumption: Manufacturers have to assess the water footprint of the operations according to ISO 14046 and ensure that they do not contribute to water scarcity.

(4) Transition to a circular economy	N/A
(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appending D of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852.

Rationale

According to the EU Chemical Strategy for sustainability, chemical pollution is one of the key drivers putting the Earth at risk, impacting and amplifying planetary crises such as climate change, degradation of ecosystems and loss of biodiversity, examples include negative effects on pollinators, insects, aquatic ecosystems and bird populations. Chemical pollutants mostly result from various human activities like the manufacturing, handling, storing, and disposing of chemicals. These occur in industrial places, agricultural use of pesticides, professional or consumer use of products containing hazardous ingredients, as well as household activities.

Substantial Contribution

Inherently safe chemicals and chemical products are needed to stop widespread chemical pollution and enable the green transition. Those ones which can replace substances of concern, or products with those hazardous ingredients, present a substantial contribution to shift towards sustainable economic activities and products.

List of Substances of Concern (SoC)

Substances having a chronic effect for human health or the environment (Candidate list in REACH and Annex VI to the CLP Regulation). These substances are posing threats to human health and ecosystems.

The groups a. – e. are substances that meet the criteria laid down in Article 57 of Regulation (EC) 1907/2006 (SVHCs) and are already integrated in climate DA as part of the generic DNSH for pollution prevention and control in the appendix C of annex 1. As regards practicality of this criterion, manufacturers have the legal obligation to assess hazard of their substance

and classify it according to the criteria set in Annex I of the CLP Regulation and to notify this to the classification and labelling inventory managed by ECHA.

The substantial contribution of manufacturing chemicals will be met by following conditions:

Section A:

The produced substance is inherently safe. That does mean, that substances and ingredients fulfilling hazardous properties criteria listed in (1) are excluded.

Section B:

The production process has to be free of those substances fulfilling the criteria of Substances of very high concern (SVHCs in REACH) Many hazardous chemicals are used in the production process and do add to pollution. No process can be regarded as sustainable or substantial contribution that needs those substances.

Section C:

The newly produced substance is replacing a substance of concern. Those safer alternatives will decrease the production/use of the former hazardous substances or material containing them and hence decrease pollution at source.

Section D:

Emissions of the facility must be limited as far as possible.

D1

The EU BAT Reference Documents (BREF) from the European Commission establish a chapter on BAT conclusions with BAT-AEL (typically an emission concentration range) that Competent Authorities need to use to approve environmental permit conditions for operators of IED installations.

Where applicable, the operator must demonstrate emission levels below the mid-point of the BAT-AEL ranges set out in the BREF documents outlined in B1 above.

Noting that the focus of sustainable contribution for this activity is on prevention and substitution of hazardous substances (according with the list above), emission levels need to remain equivalent to what is expected of state-of-the-art installations, as per the available information collected during the BREF process. As such, the rationale here has been to require

operators to demonstrate emission levels that are at or below the mid-point of the BAT-AEL range. When there is a distinction between existing or new plants, emission levels have to be equivalent to those of new plants. When there is not a BAT-AEL range but a single value, emission levels have to be below such value. https://eippcb.jrc.ec.europa.eu/reference/

D3

The WGC BREF is in about to be finalised. The maximum solvent loss proposed currently is set to <5% (BAT 23, Table 4.7). However, 21 out of 28 reference plants are already well below the level of 5%. Therefore, a level of ambition is proposed, set to 3% max. LDAR campaigns should have the features indicated in BAT19 of the WCG BREF, which include not only detecting but also repairing and maintaining leaks within 30 days of detection and a leak threshold is lower than or equal to 10,000 ppmv, which shall be reviewed and updated for the continuous improvement of the installation.

DNSH criteria Water

The DNSH criteria developed for the protection of water and water resources has to be understood in the context of the SC criteria outlined in this template. The SC prioritise prevention and substitution of SOC, with a strong link to BAT and state-of-the-art emission controls and ambitious emission levels.

For DNSH-water, there are 3 criteria that needs to be met (W1, W2, W3). The rationale is as follows:

W1. Given that SOC are targeted for prevention and substitution under SC, criterion A for DNSH for water is on ensuring that transition processes leading to these substitutions do not pose a risk for water resources and that possible accidental releases of these substances during the transition towards not using or handling SOC should be detected and eliminated. Additionally, for all other pollutants emissions to water need to comply with the requirements of the Directives and standards listed above.

W2. Appropriate additional measures should be put in place to ensure soil and groundwater protection.

W3. As a minimum, water consumption should not contribute to water scarcity in the location.

It should be noted that Directives 91/271/EEC, 2013/39/EU, 2006/118/EC, 76/160/EEC and 2010/75/EU are under review and may be revised in the near future. As a result, new, more ambitions targets may be included.

2.4 Manufacture of chemicals products

Description of the activity

Manufacture of chemical products –Activities classified under NACE code C20 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006 and which products are made of more than one substance with CAS as identity (e.g. formulations and materials)

Substantial contribution to pollution prevention and control
The aim is to produce safe alternatives to priority hazardous chemical products in safer process conditions to reduce pollution. This means the activity has to comply with all sets of technical criteria (see visual in the rationale). A. The manufactured product does not contain any substance fulfilling any hazardous properties specified in the list of Substances of Concern included below[300]. and B. The production process does not intentionally use any substance that meet the criteria of Substances of Very High Concern (i.e., substances that meet the criteria laid down in Article 57 of Regulation (EC) 1907/2006) and C. The chemical product is a replacement. Therefore, the operator has to demonstrate that an equivalent product with comparable functionality, containing at least one substance fulfilling any hazardous properties criteria in the list of Substances of Concern is currently produced[301]. And D. The activity has to comply with requirement D1, D2 and D3 regarding emission at the facility.

[300] No intentional use allowed; 0.01% threshold for impurities unless a lower limit is set by legislation.

[301] It has to be proved with an Analysis to be published and verified by an independent third party.

D1. Where applicable, the operator has to demonstrate emission levels below the mid-point of the BAT-AEL ranges[302] set out in:

a) The current Best Available Techniques Reference Document (BREF) for the large volume inorganic chemicals- Solids and others industry.

b) The current Best Available Techniques Reference Document (BREF) for large volume inorganic chemicals – Ammonia, acids and fertilizers.

c) The best available techniques (BAT) conclusions for common wastewater and waste gas treatment/management systems in the chemical sector.

d) The best available techniques (BAT) conclusions for common waste gas management and treatment systems in the chemical sector taking the formal draft of the WCG BREF into account

e) The best available techniques (BAT) conclusions for the production of chlor-alkali.

f) The best available techniques (BAT) conclusions for large volume organic chemicals.

No significant cross-media effects occur.

D2. The operator has to apply Continuous Emission Monitoring Systems (CEMS) and Continuous Effluent Quality Monitoring Systems (CEQMS) including soil- and groundwater - when applicable.

and

D3. The operator has to apply solvent waste segregation for solvent recovery from concentrated waste streams – when applicable. The maximum solvents loss from total inputs cannot exceed 3%. Total volatile organic compound (TVOC) recovery efficiency has to be at least 99%. The operator has to verify that no diffuse emission occurs by

[302] The requirements under D1 shall tackle the pollutants identified under the key environmental issues of each BREF document or the BAT-AEL of the relevant BAT conclusions Commission Implementing Decisions. Where BAT-AEL differentiate between “existing” and “new plants”, operators have to demonstrate compliance with BAT-AEL for new plants. When there is not a BAT-AEL range but a single value, emission levels have to be below such value. When the BAT-AEL range is expressed as follows: “<x-y unit” (I.e. the lower-end BAT-AEL of the range is expressed as ‘lower than’), the mid-point will be calculated using x and y. Averaging periods have to be the same as in the BAT-AEL of the BREF documents outlined above. JRC (2019) BAT conclusions chapter in the formal draft of the Best Available Techniques (BAT) Reference Document for Common Waste Gas Management and Treatment Systems in the Chemical Sector. Joint Research Centre. Directorate B – Growth and Innovation Circular Economy and Industrial Leadership Unit. European IPPC Bureau. https://eippcb.jrc.ec.europa.eu/sites/default/files/2019-12/WGC_D1.pdf

carrying out Leak detection and repair (LDAR) campaigns, at least every 3 years. Such LDAR campaigns shall have the features described in BAT19 of the WCG BREF (3).

List of Substances of Concern

a. Known & presumed carcinogenicity (Cat. 1A & 1B) (CLP H350)

b. Known & presumed germ cell mutagenicity (Cat. 1A & 1B) (CLP H340)

c. Known & presumed reproductive toxicity (Cat. 1A & 1B) (CLP H360)

d. Persistent, Bioacumulative, Toxic (PBTs) / very Persistent very Bioaccumulative (vPvBs) (identified in accordance with Art. 59 REACH following criteria in Annex XIII); criteria to be included in the CLP Regulation

e. Substances of equivalent level of concern (ELoC, including some Endocrine disruptors, respiratory sensitzizers, immunotoxic and neurotoxic substances)

f. Persistent, Mobile and Toxic (PMT), or very Persistent very Mobile vPvM (when criteria are developed and included in the CLP Regulation)

g. Endocrine disruptors (criteria to be included in the CLP Regulation)

h. Respiratory sensitizers Cat. 1 (CLP H334)

i. Specific Target Organ Toxicity - Single Exposure Cat. 1 & 2 (CLP H370 & H371)

j. Specific Target Organ Toxicity - Repeated Exposure Cat. 1 & 2 (CLP H372 & 373)

k. Hazardous to ozone layer (CLP H420)

l. Chronic hazard to the aquatic environment Cat. 1, 2, 3 & 4 (CLP H410-413)

m. Skin sensitizers Cat. 1 (CLP H317)

n. Suspected carcinogenicity (Cat. 2) (H351)

o. Suspected germ cell mutagenicity (Cat. 2) (H341)

p. Suspected reproductive toxicity (Cat. 2) (H361)

Do no significant harm (‘DNSH’)

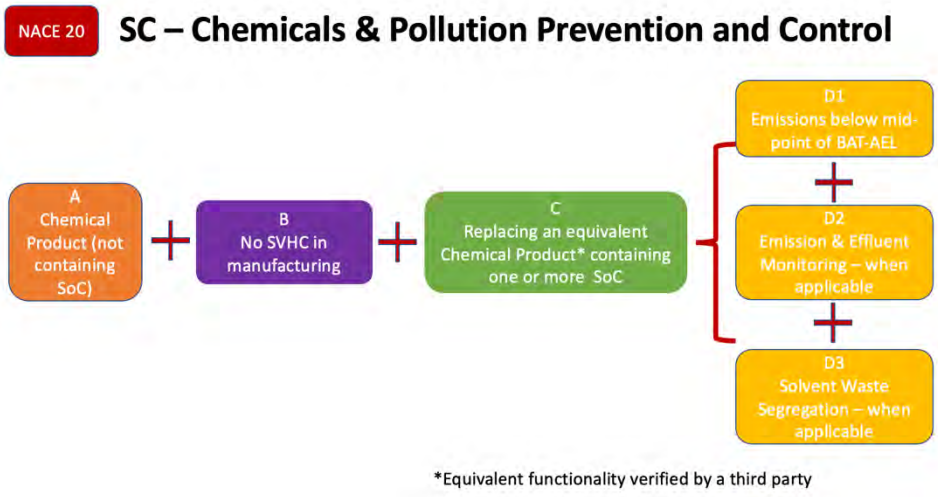
(1) Climate change mitigation	Greenhouse gas emissions tCO2e per tonne of product (Calculated in accordance with Regulation (EU) 2019/331) from the production

	process are lower than the median value[303] of the data collected in the context of establishing the EU ETS (Emissions Trading Scheme) industrial benchmarks for the period of 2016-2017.
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852.
(3) Sustainable use and protection of water and marine resources	All three water criteria have to be applied (W1, W2 and W3) W1. Waste water treatment: Elimination (until limit of detection according to current scientific standards) of the API. And, for the rest of substances, the activity has to meet the requirements of: - Urban Wastewater Treatment Directive (91/271/EEC), - Directive 2008/105/EC on Environmental Quality Standards, amended by 2013/39/EU), - Groundwater directive 2006/118/EC - Industrial Emissions Directive (2010/75/EU), - Water Framework Directive (2000/60/EC), - Drinking Water Directive (2020/2184) INDUS - Bathing Water Directive (76/160/EEC) - JRC Best Environmental Management Practice for the Public Administration Sector. 2019 - Marine Strategy Framework Directive (MSFD) 2008/56/EU - Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment The good conditions of waters in the Directives and guidelines listed above have to be achieved by appropriate technical installations at the

[303] When compliance with A3.2 or A3.3 is claimed, the average will be calculated accounting the production of the amount of each chemical product, identified in the Analysis undertaken to prove that compliance, with equivalent properties than 1 tonne of the produced chemical product under assessment.

	manufacturing plant. Waste water treatment processes must not lead to any deterioration of water bodies and marine resources. W2. Soil and groundwater protection: Inclusion of appropriate measures to prevent emissions to soil and regular surveillance of those measures to avoid leaks, spills, incidents or accidents occurring during the use of equipment and during storage. W3. Water Consumption: Manufacturers have to assess the water footprint of the operations according to ISO 14046 and ensure that they do not contribute to water scarcity.
(4) Transition to a circular economy	N/A
(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appending D of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852.

Rationale



According to the *EU Chemical Strategy for sustainability*, chemical pollution is one of the key drivers putting the Earth at risk, impacting and amplifying planetary crises such as climate change, degradation of ecosystems and loss of biodiversity, examples include negative effects on pollinators, insects, aquatic ecosystems and bird populations. Chemical pollutants mostly result from various human activities like the manufacturing, handling, storing, and disposing of chemicals. These occur in industrial places, agricultural use of pesticides, professional or consumer use of products containing hazardous ingredients, as well as household activities.

Substantial Contribution

Inherently safe chemicals and chemical products are needed to stop widespread chemical pollution and enable the green transition. Those ones which can replace hazardous substances, or products with those hazardous ingredients, present a substantial contribution to shift towards sustainable economic activities and products.

See rationale of Manufacture of Chemicals (NACE Code C20) for Pollution Prevention and Control.

2.5 Manufacture of plastic packing goods

Description of the activity

The activity is classified under NACE code C22.2.2 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

Substantial contribution to transition to a circular economy

Taxonomy eligible activities need to meet the both criteria for feedstock and design of the product.

Choice of feedstock:

- 95% mechanically recycled, chemically recycled, biobased or CCU (Carbon Capture and Utilization) feedstock.

Design of the product:

- Apply design-for-recycling principles to enable sorting and recycling at the end of life
- For packaging to be evaluated as recyclable, there has to be a recovery and recycling stream in place for the relevant materials and operating at scale.
- The recovery and recycling stream has to achieve a capture rate (based on Antonopouls-2021) above the current EU-27 average for the plastic packaging material used (e.g. PE, HDPE, LDPE, PP) in the jurisdiction(s) where the packaging is put on the market or can be demonstrated to be on track to achieving the EU's objectives for 2030.
- The packaging itself must have the ability to be sorted into those existing streams and not contaminating the stream in a harmful way. This includes the combination of different materials.
- The used materials need to be compatible within the same recycling stream or in best case the complete system is made from the same material (mono-material solution). If this cannot be achieved, separability needs to be ensured, either at the consumer level (by call-to-action or by design) or within the sorting and recycling process (options here are for example adhesives that are detachable/water-soluble or making use of density separation).
- The packaging itself must not contaminate the recycling stream in a harmful way through additives used to enhance the properties of the material or as processing aids.
- Furthermore, the used colours – like carbon-based black - may not prevent the sorting.
- Substances of concern must not be added to the feedstock when producing the packaging material itself. The relevant substances are defined in the screening criteria for Manufacture of Chemicals and Manufacture of Chemical Products (NACE Code C20) concerning pollution prevention and control.
- Where the nature of the application justifies the use of biodegradable packaging due to an overall substantial contribution of this application to the circular economy – for example in specific food related applications – the above-mentioned principles will have

to be demonstrated for the relevant waste recovery and recycling stream, in this case composting or the conversion to carboxylates, carboxylic acids or polymers.

Do no significant harm ('DNSH')	
(1) Climate change mitigation	Lifecycle GHG emissions of chemically recycled, biobased and CCU feedstock have to be lower than the life-cycle GHG emissions of the equivalent primary plastic manufactured from fossil fuel feedstock. Life-cycle GHG emissions are calculated using Commission Recommendation 2013/179/EU or, alternatively, using ISO 14067:2018 or ISO 14064-1:2018. Quantified life-cycle GHG emissions are verified by an independent third party.
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852
(3) Sustainable use and protection of water and marine resources	DNSH as set out in Appending B of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852
(5) Pollution prevention and control	DNSH as set out in Appending C of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852
(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appending D of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852

Rationale

Activity

Plastics used for packaging are the biggest use of plastic in the EU and source of plastic waste in the EU (e.g. ca. 60% of plastic waste results from packaging (source: Eunomia, 2017) / or 40% of plastic demand goes into packaging (source: Plastics Europe, 2016) (data reported in A European Strategy for Plastics in a Circular Economy, European Commission).

Most plastics used in packaging is generally thermoplastic. They come in solid/granulate form are melted and brought into a certain shape (e.g. a bottle). This process is reversible – means the plastic can be melted and processed again.

Most rubbers are cross linked / cured / vulcanized (thermoset) with the support of heat. This process is non-reversible – means it cannot be melted again and put into a different shape or form.

Rationale for substantial contribution

Choice of feedstock.

95% as max in best case 98/99% due to labelling adhesives, fresh material in master batch with dye for coloured packaging – otherwise only clear and white plastic packaging would be possible.

Design of the product.

As the manufacturer of plastic packing goods in general is not the economic actor distributing the packing to the end use – for example consumer packaged goods companies or business to business companies requiring packing solutions for their products – the focus is on applying design-for-recycling principles to enable sorting and recycling at the end of life.

Designing products for reuse and repair has not been included on the scope as the manufacturers of plastic packing goods generally have little to no control over the final application and therefore the ability to ensure a substantial contribution of the re-use system to the circular economy.

Specific KPIs in order for the recovery and recycling streams to be considered to be operating at scale for relevant materials have not been defined as recovery rates vary substantially across the EU as well as on local and regional level or between applications, for example PET used for beverage vs. food packaging. Furthermore, defining specific and rigid benchmarks

could impede progress as collection and recycling systems evolve for different materials and even the recycling rates for PET are still far away from the EU's target to recycle 75% of packaging waste by 2030 in most markets.

Some additives can change the characteristics to a point of non-recyclability (for example density changing additives or unstable compounds that can break down during recycling).

Carbon-based black colours for packaging interfere with the current sorting infrastructure. Alternative black colours are available on the market.

Quality criteria and thresholds for chemical substances that can pose a health risk have been defined for food grade recycling material and are under development for other packaging applications.

Biodegradability is generally not considered as "recyclability" and contribution to the circular economy in this context as the material would break down and therefore be lost from the material cycle and not contribute to the EU's ambition to increase recycled content in plastic packaging materials unless degradation is performed to convert the material into another material, as it happens for composting or the conversion to carboxylates, carboxylic acids or polymers.

DNSH

Alignment with DNSH defined for similar manufacturing activities in First Delegate Act.

2.6 Manufacture of durable electrical and electronic equipment

Description of the activity

Manufacture of durable electrical appliances. The activity is classified under NACE code C.26 and C.27 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

Substantial contribution to transition to a circular economy

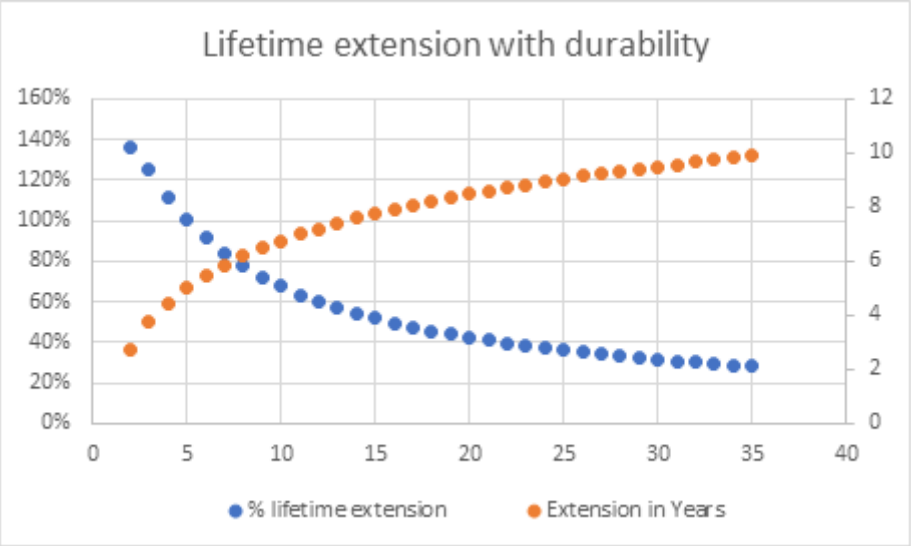
The economic activity manufactures equipment that contribute substantially to a circular economy through improved technical or functional durability that demonstrate a minimum percentage improvement, dependent on the product's lifetime compared to the same existing technologies placed on the market.

Lifetime of the product is defined as the lifetime that may be expected according to a particular set (reference set) of conditions of use and that may be used to estimate the lifetime under other conditions of use [definition Reference service life (RSL): EN 50693:2019, 3.35]. Lifetime of the product is also defined in Product Category Rules for the Life Cycle Assessment (LCA) of the relevant product range.

The lifetime improvement is calculated using the below formula:

Lifetime improvement (in number of years) = 1 + 2,5*Ln(Lifetime)

Ln = natural logarithm



This technical screening criteria is only applicable to products with a reference lifetime (before lifetime extension) of 2 years and above.

Metric and verification:

- **Technical durability**: the technical durability is assessed upon specific product rules based on standard EN45552:2020 General method for the assessment of the durability of energy-related products, based on the Annex B of the IEC 62308:2006 - Equipment reliability – Reliability assessment methods.

- Improved technical durability is demonstrated with at least a percentage improvement of B10[304] or B50[305] time to failure corresponding to the above listed threshold, depending on the nominal lifetime of the product compared to the same existing representative technology placed on the market. A representative technology placed on the same market is defined as a technology commercialized by one of three top companies in the same market, other than the manufacturer.
- The technical durability criteria can be used only if for a given product that fall in the scope of a Product Specific Rules/Standard defining the Durability Assessment, aligned with the definition given in the EN45552:2020, based on the ANNEX B of the IEC 62308:2006 - Equipment reliability – Reliability assessment methods.
- **Functional durability**: The functional durability that includes repair, maintenance and upgrades. The technology contributes substantially to a circular economy through improved functional durability if:
- The offer is sold with the monitoring device and service (digital and/or maintenance) that enables condition-based maintenance and/or preventive maintenance. Manufacturer must provide the proof that the sale of the equipment is bundled with the sale of the monitoring device and related service that enable improved durability.
- The use of such monitoring device coupled to relevant services can justify an improvement of at least a percentage improvement of the product lifespan of the product or installation corresponding to the above listed threshold, depending on the nominal lifetime.

Do no significant harm (‘DNSH’)

(1) Climate change mitigation	The activity demonstrates that durability improvement is not negatively impacting climate change, by comparing lifecycle climate change impact in kgCO2eq. Lifecycle environmental impacts are calculated and

[304] B10 life is the time at which 10% of units in a population will fail.

[305] B50 is the time at which 50% of units in a population will fail.

	compared using the Commission Recommendation 2013/179/EU or, alternatively, using the ISO 14040 and 14044. Where the activity manufactures products covered by an energy performance standard (such as the EU Energy Label or voluntary energy performance standard), the equipment complies with the top class in terms of energy performance against this standard. In addition, the use of SF6 is not allowed. If the manufactured product contains refrigerants, it complies with the GWP performance laid down in the F-gas regulation.
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852
(3) Sustainable use and protection of water and marine resources	DNSH as set out in Appending B of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852
(5) Pollution prevention and control	DNSH as set out in Appending C of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852 In addition, the activity demonstrates that durability improvement is not negatively impacting another environmental impact, by comparing lifecycle environmental impact. Lifecycle environmental impacts are calculated and compared using the Commission Recommendation 2013/179/EU or, alternatively, using the ISO 14040 and 14044. For C27 sector, relevant indicators are those identified in the PEF pilot project for Uninterrupted Power Supplies (UPS) based on normalization of environmental indicators - aligned with the recommendation of the JRC in the ILCD Handbook: - Potential for mineral abiotic resource depletion in kg Sbeq, - Potential for eutrophication in Phosphate eq, - Non-renewable primary energy consumption in MJ, and

	- Generation of dangerous waste in kg.
(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appending D of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852

Rationale

Durability relies on article 13(1) point (b) of the Taxonomy Regulation (EU) 2020/852 **(EU) 2020/852**, by focusing on the manufacture of durable electrical and electrical equipment.

The weighted average of lifetime extension has been calibrated to be aligned with the European objective to double (increase by +100%) material efficiency. This is in line with the overarching objective of the European Union to half its material footprint by 2030.

Because it is much easier to make relative durability improvements on products with a short lifetime than on products with a longer lifetime, and because products with a shorter lifetime are the ones contributing the most to the linearity of the system, the durability requirements are inversely proportionate to the lifetime of these products: the shorter the lifetime of the equipment, the higher the relative improvement needed.

Manufacturers simply have to apply a formula for the quantitative requirements, and ensure that their durability assessment (as defined in European standard) complies with that quantitative requirement. This quantitative requirement helps fostering the usability of the proposed criteria.

2.7 Manufacture of circular electrical and electronic equipment

Description of the activity

Manufacture of electrical appliances. The activity is classified under NACE code C.26 and C.27 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

Substantial contribution to transition to a circular economy

The activity complies with a least one of the following:

A. Where existing, the activity manufactures electrical and electronic products complying with all EU Ecolabel criteria, or the EU GPP comprehensive criteria applicable to that specific product category.

The manufacturer provides the proof of compliance with all requirements listed, in accordance with the verification criteria foreseen by these instruments.

B. Where product specific EU Ecolabel or EU GPP comprehensive criteria do not exist, the activity manufactures products complying with all of the following:

Design for long lifetime:

- The activity ensures that software components, software support and software/firmware updates are made available to users for the whole nominal life time of the item
- The activity ensures that functionality is not lost through (lack of) software updates

Design for repair and guarantee:

- Manufacturers ensure access to information to professional repairers, and to professional and certified repairers where life safety or electrical risks exist. In the latter case, certification relies on industry-wide standards rather than brand-specific standards.

  Main aspects to be included in the information where applicable:

  - the unequivocal appliance identification;
  - a disassembly map or exploded view;
  - list of necessary repair and test equipment;
  - component and diagnosis information (such as minimum and maximum theoretical values for measurements);
  - wiring and connection diagrams;
  - diagnostic fault and error codes (including manufacturer-specific codes, where applicable); and
  - -data records of reported failure incidents stored on the product (where applicable).

- Ensure key spare parts (such as – non exhaustive list – motors, batteries, and any part essential to the good functioning of the product) availability for 1 additional year compared to legal requirements.
  Where no legal requirement apply, key spare part should be available for at least 8 years after production ceases.
- Where no safety or electrical risk exist, manufacturers provide clear disassembly and repair instructions (e.g. hard or soft copy, video) and make them publicly available, to enable a non-destructive disassembly of products for the purpose of replacing key components or parts for upgrades or repairs.
- The manufacturer provides commercial guarantee 1 additional year compared to legal requirements at no extra cost

Design for remanufacturing:

- Where the products able to store data, data encryption is required, alongside a software function that resets the device to its factory settings and erases by default the encryption key
- The stored data can be easily and fully transferred to another product.

Design for dismantling

- Information on product's end of life management is publicly available, with all requirement information under EU directive 2012/19/EU on Waste Electrical and Electronic Equipment (WEEE). Dismantling information include the sequence of dismantling steps, tools or technologies needed to access the targeted component.
- The activity provides traceability information on SVHC, by complying with at least one of the two disclosure frameworks listed below:
  - Product information on substances is available publicly, in SCIP database or in a specific public tool provided by company
  - Product information on substances is available publicly, following IEC62474 (for EEE) and future IEC82474 for all other sectors (dual logo project)

Design for recyclability:

The activity manufactures products with demonstrated superior recyclability. Assessment of recyclability relies on EN 45555:2019 (General methods for assessing the recyclability and recoverability of energy-related products). All following requirements are met:

- Product recyclability is above 80% . Product recyclability is measured according to EN 45555:2019.
- Plastic parts do not contain halogenated flame retardants
- Use of single polymer or recyclable polymer blend
- Plastic enclosures shall not contain moulded-in or glue-on metal.
- Materials which cannot be recycled together have the ability to be separated
- Improving recyclability rate shall not harm the durability of the system itself
- Joining, fastening or sealing techniques do not prevent the safe and readily achievable removal of the components indicated in WEEE or in Directive 2006/66/EC on batteries and accumulators and waste batteries and accumulators, when present.

Proactive substitution of hazardous substances

The activity manufactures products which demonstrate proactive substitution of hazardous substances. All 4 criteria below are met:

1-No SVHC in REACH Annex 14 in each article are contained in the product. Authorization to Annex 14 is not allowed.

2- RoHS exemptions are limited to the following two:

A. Lead in high melting temperature type solders (i.e. lead- based alloys containing 85 % by weight or more lead)
B. Electrical and electronic components containing lead in a glass or ceramic other than dielectric ceramic in capacitors, e.g. piezoelectronic devices, or in a glass or ceramic matrix compound

3- Restriction on the presence of specific substances

The hazardous substances specified in table below shall not be intentionally added to or formed in the specified sub-assemblies and component parts at or above the stipulated concentration limit.

Substance group	Scope of restriction	Concentration limits (where applicable)

ii) Polymer stabilisers, colourants and contaminant	The following organotin stabiliser compounds classified with Group 1 and 2 hazards shall not be present in external cables: Dibutyltin oxide Dibutyltin diacetate Dibutyltin dilaurate Dibutyltin maleate Dioctyl tin oxide Dioctyl tin dilaurate External housing shall not contain the following colourants: Azo dyes that may cleave to the carcinogenic aryl amines listed in Appendix 8 of the Regulation (EC) No 1907/2006, and/or Colourant compounds included in the IEC 62474 declarable substances list.	n/a
ii) Polymer stabilisers, colourants and contaminant	Polycyclic Aromatic Hydrocarbons (PAHs) classified with Group 1 and 2 hazards shall not be present at concentrations greater than or equal to individual and sum total concentration limits in any external plastic or man-made rubber surfaces. The presence and concentration of the following PAHs shall be verified: PAHs restricted by the Regulation (EC) No 1907/2006: Benzo[a]pyrene Benzo[e]pyrene Benzo[a]anthracene Chrysen Benzo[b]fluoranthene Benzo[j]fluoranthene	The individual concentration limits for PAHs restricted under Regulation (EC) No 1907/2006 shall be 1 mg/kg The sum total concentration limit for the 18 listed PAHs shall not be greater than 10 mg/kg

	Benzo[k]fluoranthene Dibenzo[a,h]anthracene Additional PAHs subject to restriction: Acenaphthene Acenaphthylene Anthracene Benzo[ghi]perylene Fluoranthene Fluorene Indeno[1,2,3-cd]pyrene Naphthalene Phenanthrene Pyrene	
iii) Biocidal products	Biocidal products intended to provide an anti-bacterial function Derogation for materials sold in hospitals and for healthcare applications	n/a
v) Glass fining agents	Arsenic and its compounds shall not be used in the manufacturing of LCD display unit glass and screen cover glass.	0,0050% w/w
vi) Chlorinebased plastics	Plastic parts >25g must not contain chlorinated polymers. Note: For this specific sub-requirement, plastic cable housing is not considered as a “plastic part”.	n/a

4 - Halogen free products, which follow existing standards for all its components: cables (IEC 60754-3), plastic parts (EN50642), electronic components (IEC 61249-2-21 or JS709C), consumables (IEC 61249-2-21 and IPC J-STD-004B) and no Fluor gas

Derogations for the use of halogens

Sub-assembly or component part	Scope of derogation
i) Printed Circuit Boards	Flame retardants classified with a Group 3 hazard and TBBPA (classified with Group 2) are derogated for use.
ii) External cables	Flame retardant and its synergist classified with Group 3 hazard and Antimony trioxide -Sb2O3 -(classified with Group 2) are derogated for use.
iii) External housing	Flame retardants and their synergists classified with Group 2 and 3 hazards are derogated for use.

Notes :

- Group 1 hazards : Hazards that identify a substance or mixture as being within Group 1:
    - Substances that appear on the Candidate List for Substances of Very High Concern (SVHCs)
    - Carcinogenic, Mutagenic and/or Toxic for Reproduction (CMR) Category 1A or 1B CMR: H340, H350, H350i, H360, H360F, H360D, H360FD, H360Fd, H360Df
- Group 2 hazards : Hazards that identify a substance or mixture as being within Group 2:
    - Category 2 CMR: H341, H351, H361f, H361d, H361fd , H362
    - Category 1 aquatic toxicity: H400, H410
    - Category 1 and 2 acute toxicity: H300, H310, H330
    - Category 1 aspiration toxicity: H304
    - Category 1 Specific Target Organ Toxicity (STOT): H370, H372
- Group 3 hazards : Hazards that identify a substance or mixture as being within Group 3:
    - Category 2, 3 and 4 aquatic toxicity: H411, H412, H413

- Category 3 acute toxicity: H301, H311, H331, EUH070
- Category 2 STOT: H371, H373

Information to customers:

The activity operator provides information to customers regarding options to use the product considering the environmental benefits, in particular the lifetime extension of the products associated with the different modes of the product

Do no significant harm ('DNSH')

(1) Climate change mitigation	If the manufactured product contains refrigerants, it complies with the GWP performance laid down in the F-gas regulation. The activity does not manufacture products containing SF6. Where applicable, the equipment does not score lower than the 3rd class on the energy label applicable to the product range.
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852
(3) Sustainable use and protection of water and marine resources	DNSH as set out in Appending B of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852
(5) Pollution prevention and control	DNSH as set out in Appending C of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852

(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appending D of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852

Rationale

The manufacture of new electric and electronic equipment can make a substantial to the circular economy only under the condition that they are circular by design.

Circularity and material efficiency aspects are an important aspect of the environmental impact of EEE and, where these exist, they are covered under existing best in class type I ecolabel such as the EU Ecolabel.

A quick comparative assessment of existing type I ecolabels showed that, while the EU Ecolabel and other EU best in class tools such as the EU GPP comprehensive criteria did cover all relevant material efficiency aspects, it was not the case for all the regional or national type I labels. This is why, the proposal is only to refer to EU criteria or equally stringent ones.

In addition, although the EU Ecolabel and EU GPP criteria cover additional aspects compared to the sole material efficiency aspects, we propose compliance with the full set of criteria as these labels are developed to work as a comprehensive and cumulative set of requirements. The EU Ecolabel and other EU best in class tools such as the EU GPP comprehensive criteria did cover all relevant material efficiency aspects, it was not the case for all the regional or national type I labels. This is why, the proposal is only to refer to EU criteria or equally stringent ones." Opting for EU-wide criteria also avoids internal barriers to the Internal Market and thus also promotes recycling on as large as possible market

This option is **politically coherent**, as it builds on existing EU best-in-class tools which are widely recognised.

Regarding the substantial contribution criteria: they have good **environmental integrity**: in terms of the level of ambition that they represent, these criteria are meant to be achievable by 10-20% of the products of a specific category placed on the market, which is a fair level of ambition.

The horizontal circular economy criteria are based on existing best in class instruments and types of requirements, hence corresponding to the same level of ambition.

The DNSH requirements are aligned with the F-Gas Regulation regarding the use of refrigerants. In addition, the use of SF6, currently not covered under the F-Gas Regulation, but still one of the most potent greenhouse gases (with a GWP of 23500, according to the IPCC AR5) is excluded.

Most products under this category are not covered under any EU Ecolabel or EU GPP criteria. In order to make sure that circularity can equally be identified for these products (**level playing fiel**d), a set of horizontal requirements was developed for all EEE product categories where harmonised and already agreed EU best in class criteria do not exist yet. In order to make them as good at the previous option from an **environmental integrity, a usability and a political coherence** point of view, these were largely inspired by existing EU Ecolabel criteria.

The proposed criteria are **usable**. Most of them are in fact already being used typically by existing best in class instruments.

2.8 Resell and/or remanufacture of used electrical and electronic equipment

Description of the activity

Resell and/or remanufacture of electrical and electronic equipment. The activity resells and/or remanufactures equipment produced through activities carried out under NACE codes C.26 and C.27 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

Substantial contribution to transition to a circular economy

The activity complies with a least one of the following:

A. **The activity resells electrical and electronic equipment used before by a customer** (household or organisation), possibly after its refurbishment and/or remanufacturing, with a minimum warranty period of two years.

The warranty covers repair or replacement, during which time goods are ensured to be in conformity with the contract specifications at no additional cost. If applicable, for the guarantee period arrangements need to be made with retailers to add no cost if manufacturers supply the part free-of-charge. If applicable, if the equipment has been refurbished and/or remanufactured before reselling, at least 50% by weight of the equipment components or parts have been retained. Used material and components not reused in the same piece are reutilised elsewhere. Where this is not possible, they are recycled.

B. **The economic activity provides services which refurbish and/or remanufacture EEE in use by a customer** (household or organisation), with a minimum warranty period of two years.

The warranty covers repair or replacement, during which time goods are ensured to be in conformity with the contract specifications at no additional cost. If applicable, for the guarantee period arrangements is made with retailers to add no cost if manufacturers supply the part free-of-charge. If applicable, if the equipment has been refurbished and/or remanufactured before reselling, at least 50% by weight of the equipment components or parts have been retained. Used material and components not reused in the same piece are reutilised elsewhere. Where this is not possible, they are recycled.

C. **The activity repurposes used industrial and electric vehicle batteries.** This activity covers the repurposing of industrial and electric vehicle batteries, that are no longer fit for the initial purpose for which they were manufactured and used for a different purpose, such as stationary energy storage batteries.

Do no significant harm ('DNSH')

(1) Climate change mitigation	Where remanufacture or selling of remanufactured product takes place, the activity ensures that that the energy efficiency performance of the product is as good as when the product was first placed on the market.
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852

(3) Sustainable use and protection of water and marine resources	DNSH as set out in Appending B of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852
(5) Pollution prevention and control	DNSH as set out in Appending C of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852
(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appending D of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852

Rationale

Remanufacture is a political objective fostered under the Circular Economy Action Plan as well as under the upcoming Sustainable Products Initiative of the European Commission.

Boundaries of the activity: Remanufacturing electrical and electronic equipment and bringing them into the market for reuse, ensuring a 'like new' quality, complying with the legal requirements applying to new products.

Definition of remanufacturing (Ardente et al (2018)): '*industrial process during which worn-out products are restored to a like-new condition by deconstructing/disassembling the product, cleaning and refurbishing any usable components, and reassembling the product with any new parts, if required*'

The remanufacturing of EEE includes the following sub-activities:

Selection

During this step, decisions regarding the type and condition of devices for refurbishing are taken. Typically, the selection process is based on criteria related to the types of models, age and condition of devices, and possibly also service history and performance.

These criteria are used to enable a targeted sourcing and to avoid the purchase of devices, which will prove unsuitable for high quality refurbishing.

Sourcing

The sourcing is the transaction of the equipment from the owner and/or user to the refurbishing entity. Sourcing mostly includes some form of incentives such as direct payments or trade-in models, the logistics to transport the used equipment to a refurbishing facility in a safe manner (e.g. protection against damages), and activities and measures to communicate information on incentives and transaction processes to a target audience. Depending on the type of product, sourcing might also include de-installation (e.g. necessary for large equipment) and paperwork to comply with legislative requirements. Sourcing is the most critical element of the IT refurbishment process: if there is not enough input the remanufacturing operations will face economic challenges.

Technical Refurbishing

The technical refurbishing encompasses all steps necessary to bring a device back to the original level of functionality, including safety, reliability and aesthetics. This typically includes cleaning and disinfection, the conduct of necessary repairs, the exchange of individual parts/components, aesthetic refurbishment, system testing and packaging.

Sale/Delivery

This step includes all activities to bring the devices into (second) use. This includes marketing, sale, delivery and possibly also installation at the customers' premises.

Warranty

Remanufacturing also requires technical support, including repair and maintenance within the warranty conditions and periods

Currently, around 1% of revenues from EEE are generated from remanufactured equipment.

All products covered in C.26 and C.27 are encompassed in this activity.

The metric proposed for this activity is weight, which is an easy indicator, implemented widely, included by the remanufacturing sector.

2.9 Manufacture of equipment generating electricity and/or heat

Description of the activity

Manufacturing of heat and power generating equipment (covering NACE C. 25.2, C.25.3, C.28.11, C.28.12, C.28.13, C.28.21) Equipment generating radioactive waste is excluded.

Substantial contribution to pollution, prevention and control

This activity manufactures equipment used to produce electricity and/or heat under NACE C.25 and C.28 and fulfils the following cumulative criteria:

1. **Acidification potential:**

The activity manufactures equipment designed to achieve the life cycle emissions lower than the following threshold of SO_2eq per kWh of electricity or heat output.

- 100 mgSO_2eq /kWh of heat or electricity until 2030.
- 50 mgSO_2eq /kWh after 2030

The calculation of the acidification potential includes all pollutants relevant for the activity, in particular NO_x, SO_2 and NH_3.

2. **Photochemical ozone creation potential:**

The activity manufactures equipment designed to achieve life cycle emissions lower than 50mg of C2H2 per kWh of electricity or heat output.

The calculation of the photochemical ozone creation potential includes all pollutants relevant for the activity, in particular CO, NOx and relevant VOCs.

3. **Eutrophication potential:**

The activity manufactures equipment designed to achieve life cycle emissions lower than 50mg of PO43 per kWh of electricity or heat output.

The calculation of the eutrophication potential includes all pollutants relevant for the activity, in particular NO_x, NH_4^+, N, PO_4^{3-}, P and COD (chemical oxygen demand).

4. **Particulate matter PM10:**

The activity manufactures equipment designed to achieve life cycle emissions lower than 50mg of PM10 per kWh of electricity or heat output.

5. **Fine particulate matter PM2.5:**

The activity manufactures equipment designed to have life cycle emissions lower than 20mg of PM2.5 per kWh of electricity or heat output.

For criteria 1-5, life cycle environmental impacts are calculated using the Commission Recommendation 2013/179/EU. The Life Cycle Assessment (LCA) scenarios take into account the likely place and conditions of operation of the equipment. Life cycle environmental impacts are third party verified in according with the procedure described in ISO 14044.

6. **Painting and coating of equipment:**

Where the activity entails the painting and coating of metals and plastics, the activity complies with the TVOCs emissions limits listed in the BAT-AELs of the relevant BAT reference document (namely the BREFs on surface treatment of metals and plastics and the BREF on surface treatment using organic solvents).

Do no significant harm ('DNSH')

(1) Climate change mitigation	The activity manufactures the equipment using energy with direct emissions lower than 270gCO2/kWh. The manufactured equipment is designed to achieve direct emissions during its operation lower than 270gCO_2e/kWh. For boilers, the thermal energy efficiency of the equipment produced is above 90%.
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852

(3) Sustainable use and protection of water and marine resources	DNSH as set out in Appending B of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852
(4) Transition to a Circular Economy	The activity assesses the availability of and, where feasible, adopts techniques that support: (a) reuse and use of secondary raw materials and reused components in products manufactured; (b) design for high durability, recyclability, easy disassembly and adaptability of products manufactured; (c) information on and traceability of substances of concern throughout the life cycle of the manufactured products
(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appending D of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852

Rationale

Existing (and relatively recent) literature[306] enables to identify the current best performers on the market. Since the activity manufactures new equipment, environmental integrity can only

[306] Turconi R, et al, Life cycle assessment (LCA) of electricity generation technologies: Overview, comparability and limitations. Renewable and Sustainable Energy Reviews 2013;28:555–65. https://doi.org/10.1016/j.rser.2013.08.013.

be ensured using absolute best performers. Given that pollution impacts arising from these products have been decreasing for the past decades, we can expect that new equipment will continue improve its performance. In addition, energy producing equipment is usually designed to last for several decades. The past dependence is therefore important and may be reflected on LCA data performed on currently operating equipment. From this perspective, a sunset clause such as that displayed in the SC criteria is appropriate.

The level of ambition is higher as far as the performance of produced equipment is concerned (designing out pollution) as this is where the biggest contribution to the environmental objective can be made.

The metric and approach used enables to remain technology neutral and therefore maintain the level playing field between all energy producing equipment.

Regarding the performance of the equipment produced (designing out pollution):

- Data for best performers is known: it is possible to set a relevant level of ambition.
- LCA results rests upon known metrics and harmonised methodologies, they are therefore usable.
- It is required the use of LCA studies according to the prescription of the Product Environmental Footprint due to the many uncertainties linked with the LCA. In particular, unlike other LCA methodologies (such as the generic ISO 14040 and ISO 14044 standards), the fact that the product environmental footprint recommends the use of harmonised LCA data bases ensures that these uncertainties do not translate into a important variation in the results communicated by economic operators under this NACE code.

Hertwich EG, et al, Integrated life-cycle assessment of electricity-supply scenarios confirms global environmental benefit of low-carbon technologies. Proc Natl Acad Sci USA 2015;112:6277. https://doi.org/10.1073/pnas.1312753111.

Garcia R, et a, Life-cycle assessment of electricity in Portugal. Applied Energy 2014;134:563–72. https://doi.org/10.1016/j.apenergy.2014.08.067.

Bonamente, E.; Aquino, A. Environmental performance of innovative ground-source heat pumps with pcm energy storage. Energies 2020, http://dx.doi.org/10.3390/en13010117

Regarding the performance of the manufacturing activity itself (reducing direct pollution):

- Best practices are known and in place for several manufacturing processes covered under the activity

These are used and widely applied by manufacturers.

2.10 Manufacture of high, medium and low voltage electrical equipment that result in or enable substantial contribution to climate change mitigation

Description of the activity

The activity manufactures high, medium and low voltage electrical equipment that result in or enable substantial contribution to climate change mitigation in other sectors of the economy. The activity includes technologies for the integration of renewable sources of energy in the Union electric grids (through the management and compensation of fluctuations of renewable energy production and demand management), the recharging of the zero emissions vehicles, and the deployment of smart metering and control technologies for energy efficiency.

The activity is classified under NACE codes C.27.1, C.27.3, and C.27.9.

The activity is an enabling activity in accordance with Article 10(1), point (i), of Regulation (EU) 2020/852 where it complies with the technical screening criteria set out in this Section.

Substantial contribution to climate change mitigation

The activity of manufactures of one or more of the following products:

a) Electronic vehicle (EV) charging stations and supporting electric infrastructure for the electrification of transport, subject to eligibility under the transport Section of Annex 1 to the Commission Delegated Regulation (EU) supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council by establishing the technical screening criteria for determining the conditions under which an economic activity qualifies as contributing substantially to climate change mitigation or climate change

adaptation and for determining whether that economic activity causes no significant harm to any of the other environmental objectives.

b) Transmission and distribution transformers that comply with the Tier 2 (1 July 2021) requirements set out in Annex I to the Commission Regulation (EU) No 2019/1783 and, for medium power transformers with highest voltage for equipment not exceeding 36 kV, with AA0 level requirements on no-load losses set out in standard EN 50708[307] series.

c) Low voltage equipment to increase the controllability of the electricity system, integrate renewable energy and generate energy efficiency, in residential or commercial or industrial building applications
   - Connected circuit breakers and switchgear that are equipped with energy metering devices;
   - Home Building Electronic Systems (HBES) and related connected products;
   - Metering equipment that enable to monitor and control energy consumption by type of energy usage, enabling energy efficiency or peak load shifting per usage

d) Demand response and load shifting technologies:
   - Carry information to users for remotely acting on consumption, including customer data hubs;
   - Automated technologies for load management restricted to energy control centres (ECCs) and their core components: Smart switchboards, connected contactors, connected relays, connected circuit breakers, automatic transfer switches. Core components must be installed as part of ECCs

e) Communication, software and control technologies for energy efficiency and integration of renewable energy:
   - Equipment to allow for exchange of specifically renewable electricity between users;
   - Advanced software and analytics to maximise energy efficiency and consumption of renewable energy, at the level of a building or a neighbourhood, such as Microgrid Management System. Direct usage for energy efficiency and integration of renewable must be proven.

[307] A new Commission regulation has been adopted in 2019 on transformers. The elements on transformers that are proposed in the section 4.9 on transmission and distribution should be updated to reflect this recent update. The equivalent is IEC TS 60076-20: POWER TRANSFORMERS –PART 20: ENERGY EFFICIENCY

The economic activity manufactures electrical equipment that complies with the latest regulations and standards, that increase the energy performance and the development and integration of renewable energy sources, in particular with the following standards where relevant:

- The economic activity manufactures electrical equipment that complies with the latest regulations and standards, that increase the energy performance and the development and integration of renewable energy sources, in particular with the following standards where relevant: IEC 60364-8-1: Low-voltage electrical installations – Part 8-1: Energy efficiency
- IEC 60364-8-2: Low-voltage electrical installations - Part 8-2: Prosumer's low-voltage electrical installations
- IEC 61800-9-1: Ecodesign for power drive systems, motor starters, power electronics and their driven applications - General requirements for setting energy efficiency standards for power driven equipment using the extended product approach (EPA) and semi analytic model (SAM)
- IEC 61800-9-2: Ecodesign for power drive systems, motor starters, power electronics and their driven applications - Energy efficiency indicators for power drive systems and motor starters
- IEC TR 63196 Low-Voltage Switchgear and Controlgear and their assemblies - Energy efficiency

The activity does not manufacture products containing SF6.

Do no significant harm (‘DNSH’)

(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852
(3) Sustainable use and protection of water and marine resources	DNSH as set out in Appending B of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852

(4) Transition to a Circular Economy	The activity assesses availability of and, where feasible, adopts techniques that support: (a) reuse and use of secondary raw materials and re-used components in products manufactured; (b) design for high durability, recyclability, easy disassembly and adaptability of products manufactured; (c) waste management that prioritises recycling over disposal, in the manufacturing process.
(5) Pollution prevention and control	DNSH as set out in Appending C of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852
(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appending D of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852

Rationale

Recital 23 of the Commission Delegated Regulation (EU) supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council by establishing the technical screening criteria for determining the conditions under which an economic activity qualifies as contributing substantially to climate change mitigation or climate change adaptation and for determining whether that economic activity causes no significant harm to any of the other environmental objectives states the following: ‘the manufacturing of electrical equipment for electricity plays an important role for the upgrade, uptake and compensation of fluctuations of the electricity provided by the renewable sources of energy in the Union electric grids, the recharging of the zero emissions vehicles and deployment of smart, green house applications. At the same time, manufacturing of electrical equipment for electricity might enable the development of the smart housing concept with the objective of further promoting the use of

renewable sources of energy and the good management of home equipment. **It might therefore be necessary to complement the technical screening criteria in the manufacturing sector and to assess the potential of the manufacture of electrical equipment to make a substantial contribution to the climate change mitigation and climate change adaptation'**. This activity is meant to complements the delegated act.

Electrification is a core component of Europe's climate strategy. According to JRC Technical Report "Towards net-zero emissions in the EU energy system by 2050" (2020), depending on energy scenarios, in 2050 electricity will directly contribute to between 35% and 65% of final energy consumption which is a contribution 2 to 3 times higher than today. This will require investment in electricity transmission and distribution equipment and infrastructure, with technologies that support energy efficiency, demand response, interconnexion of energy systems and the integration of renewable energy.

The use of SF6, currently not covered under the F-Gas Regulation, but still one of the most potent greenhouse gases (with a GWP of 23500, according to the IPCC AR5) is excluded, as products containing substances with such a high GWP cannot be deemed to make a substantial contribution to the objective of climate change mitigation.

A large share of technologies included in this section are already recognised as climate mitigation activities in the Climate Mitigation Delegated Act, as part of technical screening criteria applicable to companies that operate electricity transmission and distribution grid and built infrastructure. The objective of this section is to create a level playing field between the companies manufacturing equipment and the companies installing and operating that same equipment. Said differently, a "green CAPEX" on the side of the infrastructure operator should also qualify as "green revenues" on the side of the technology manufacturer.

For high and medium voltage transmission and distribution equipment, technologies are already included in section 4.9 on transmission and distribution of electricity.

The criteria are set are a closed list of technologies are therefore usable.

2.11 Manufacture of machinery enabling closed-loop systems, and high-quality waste collection and waste management

Description of the activity

Manufacture of equipment and machinery aimed at, and demonstrating a substantial contribution to the transition to a circular economy, as defined in article 13 of EU Regulation (EU) 2020/852, where those technologies are not covered in other sections of this Annex.

The economic activities in this category could be associated with several NACE codes, C25, 26, C27 and C28 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

An economic activity in this category is an enabling activity in accordance with Article 13(1), point (l), of Regulation (EU) 2020/852 where it complies with the technical screening criteria set out in this Section.

Substantial contribution to transition to a circular economy

The economic activity is the manufacture or provision of one or more of the following technologies:

- Machinery for reuse and reuse systems (NACE C.28)
- Waste collection equipment enabling segregated collection per waste type (NACE C. 25, 28), Material sorting machines, enabling sorting of comingled light packaging waste, such as machines separating fibres from containers; sorting fibres; sorting metal containers by using magnets, eddy currents or X-ray; or sorting of plastic containers by polymer (e.g. separation of PET bottles from other plastic containers) (NACE C.28),
- Material recycling equipment used for mechanical recycling and directly enabling to meet the substantial contribution criteria of another activity substantially contributing to the transition to the circular economy (NACE C.27, 28),

The activity makes a substantial contribution to the environmental objective by proving that the machinery is essential and material to achieve the substantial contribution criteria in another activity substantially contributing to the transition to the circular economy. In particular, the activity proves that:

- The use of this equipment always helps make a substantial contribution to the transition to the circular economy,

- The equipment directly helps fulfil the technical screening criteria of the enabled activity (i.e. another taxonomy aligned activity substantially contributing to the transition to the circular economy), which is the intended use of the machine

This assessment is publicly disclosed and 3rd party verified. The 3rd party assessment is publicly disclosed.

Do no significant harm ('DNSH')

(1) Climate change mitigation	The manufactured equipment has a life cycle performance above average compared to technologies with a similar purpose currently available on the market. Environmental Impacts are calculated using Recommendation 2013/179/EU. Quantified life-cycle environmental impact reductions are verified by an independent third party which transparently assesses how the standard criteria, including those for critical review, have been followed when the value was derived. The 3rd party assessment is publicly disclosed The activity assesses the availability of and, where feasible, adopts techniques that support: - Energy efficiency of the equipment, - Minimization of embodied GHG emissions, For energy-related products, the use of decarbonized energy sources during the product's operation,
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852
(3) Sustainable use and protection of water and marine resources	DNSH as set out in [Appending B of Annex 1 to the Commission Delegated Regulation (EU) …/… supplementing Regulation (EU) 2020/852]

	In addition, the manufactured equipment has a life cycle performance above average compared to technologies with a similar purpose currently available on the market. Environmental Impacts are calculated using Recommendation 2013/179/EU. Quantified life-cycle environmental impact reductions are verified by an independent third party which transparently assesses how the standard criteria, including those for critical review, have been followed when the value was derived. The 3rd party assessment is publicly disclosed
(5) Pollution prevention and control	DNSH as set out in [Appending C of Annex 1 to the Commission Delegated Regulation (EU) …/… supplementing Regulation (EU) 2020/852] In addition, the manufactured equipment has a life cycle performance above average compared to technologies with a similar purpose currently available on the market. Environmental Impacts are calculated using Recommendation 2013/179/EU. Quantified life-cycle environmental impact reductions are verified by an independent third party which transparently assesses how the standard criteria, including those for critical review, have been followed when the value was derived. The 3rd party assessment is publicly disclosed
(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in [Appending D of Annex 1 to the Commission Delegated Regulation (EU) …/… supplementing Regulation (EU) 2020/852]

Rationale
This activity is based on Article 16 of Regulation (EU) 2020/852.

On the methodology, the European Commission Climate delegated act adopted on 4th June 2021 also list enabling activities. For instance, for the objective of climate change mitigation, the climate delegated act lists specific manufacturing activities which enable, in their nature, to make a substantial to the climate change mitigation objective (it is for instance the case of renewable energy equipment). It also contains a more 'open' activity whereby the substantial contribution has to be proven, showing substantial GHG emissions reduction using an LCA approach.

This activity lies somewhere in between: on the one hand, it refers to specific machinery type, with a specific purpose closely connected to the transition to the circular economy. On the other however, the machinery identified in this activity is not necessarily machinery able to make a substantial contribution to the circular economy, as it depends where that machine is used. For instance, highly efficient sorting machines may be used for mixed packaging waste so as to maximise the homogeneity of waste and improve material recovery, but it can also be used to sort out various extracted materials. In the former case, the machinery could make a substantial contribution to the transition to the circular economy while in the latter, it would not.

This is why additional requirements are proposed to ensure that the manufactured machinery enables the substantial contribution to be made.

The objective of this activity is to target the most obvious and widespread uses of machinery in a circular economy, i.e. machines contributing to creating inner loops (e.g. essential for a well-functioning reuse systems) but to recover material in an effective way (e.g. used to collect homogenous waste types, or best sorting technologies).

Given that sometimes, the same equipment can be used in activities which do contribute to making a substantial contribution to the circular economy, and sometimes not, a case-by-case assessment of the activity operator proving that there is a direct and causal link between the equipment and the substantial contribution achieved in another activity.

Where economic activities have the potential to enable substantial circularity benefits in other sectors, these should also be included (assuming the life cycle performance of the activity do not undermine other environmental objectives).

The activity is broad and technology neutral in the sense that the technology simply must showing a direct and causal link with the enabled activity. In this, any machinery or equipment manufacturer can comply

2.12 Manufacture of machinery, equipment and solutions enabling a substantial contribution to the circular economy.

Description of the activity

Manufacture of equipment, machinery and related services, aimed at, and demonstrating a substantial contribution to the transition to a circular economy, as defined in article 13 of EU Regulation (EU) 2020/852, where those technologies are not already explicitly covered in other activities substantially contributing to the transition to the circular economy.

The economic activities in this category can be associated with several NACE codes, C25, 26, C27, C28, J61, J.62, J.63 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

An economic activity in this category is an enabling activity in accordance with Article 13(1), point (l), of Regulation (EU) 2020/852 where it complies with the technical screening criteria set out in this Section.

Substantial contribution to transition to a circular economy
The activity manufactures an equipment and/or related services and/or components complying with all of the following: A. Direct link between the and/or related services and/or components and taxonomy alignment. The activity directly sells an equipment and/or related services and/or components to an economic operator using it in a taxonomy aligned activity substantially contributing to the transition to the circular economy. Information on clients is provided to the third party verifier and include information derived from primary information from the product user. The assessment of the independent 3rd party is publicly disclosed (redacting business confidential information. B. Substantial contribution of the enabling activity: The activity makes a substantial contribution to the environmental objective, by proving that the equipment and/or related services and/or components is essential and material to

achieve the substantial contribution criteria in another activity substantially contributing to the transition to the circular economy. In particular, the activity proves that:

1. The use of this equipment always helps make a substantial contribution to the transition to the circular economy.

2. For complete machines/systems, it is proven and documented that it is able to fulfil the technical screening criteria of the activity, which is the intended use of the machine/system.

3. For components, it must be proven and documented that these components are the reason why the capabilities of a system with this component is different from conventional systems without this component (e.g. special sensors). Therefore, this does not include standard components used also in systems not able to reach the necessary technical screening criteria

The full assessment is publicly disclosed and 3rd party verified. The 3rd party assessment is publicly disclosed.

Do no significant harm ('DNSH')

(1) Climate change mitigation	The manufactured equipment has a life cycle performance above average compared to technologies with a similar purpose currently available on the market. Environmental Impacts are calculated using Recommendation 2013/179/EU. Quantified life-cycle environmental impact reductions are verified by an independent third party which transparently assesses how the standard criteria, including those for critical review, have been followed when the value was derived. The 3rd party assessment is publicly disclosed The activity assesses the availability of and, where feasible, adopts techniques that support: - Energy efficiency of the equipment, - Minimization of embodied GHG emissions,

	For energy-related products, the use of decarbonized energy sources during the product's operation
(2) Climate change adaptation	DNSH as set out in [Appending A of Annex 1 to the Commission Delegated Regulation (EU) …/… supplementing Regulation (EU) 2020/852]
(3) Sustainable use and protection of water and marine resources	DNSH as set out in [Appending B of Annex 1 to the Commission Delegated Regulation (EU) …/… supplementing Regulation (EU) 2020/852] In addition, the manufactured equipment has a life cycle performance above average compared to technologies with a similar purpose currently available on the market. Environmental Impacts are calculated using Recommendation 2013/179/EU. Quantified life-cycle environmental impact reductions are verified by an independent third party which transparently assesses how the standard criteria, including those for critical review, have been followed when the value was derived. The 3rd party assessment is publicly disclosed
(5) Pollution prevention and control	DNSH as set out in [Appending C of Annex 1 to the Commission Delegated Regulation (EU) …/… supplementing Regulation (EU) 2020/852] In addition, the manufactured equipment has a life cycle performance above average compared to technologies with a similar purpose currently available on the market. Environmental Impacts are calculated using Recommendation 2013/179/EU. Quantified life-cycle environmental impact reductions are verified by an independent third party which transparently assesses how the standard criteria, including those for critical review, have been followed when the value was derived. The 3rd party assessment is publicly disclosed

(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in [Appending D of Annex 1 to the Commission Delegated Regulation (EU) …/… supplementing Regulation (EU) 2020/852]

Rationale

This activity is based on Article 16 of Regulation (EU) 2020/852.

On the methodology, these criteria took as a starting point the European Commission Climate delegated act adopted on 4th June 2021, which also lists enabling activities. For instance, for the objective of climate change mitigation, the climate delegated act lists specific manufacturing activities which enable, in their nature, to make a substantial to the climate change mitigation objective (it is for instance the case of renewable energy equipment). It also contains a more 'open' activity whereby the substantial contribution has to be proven, showing substantial GHG emissions reduction using an LCA approach.

This activity builds on the latter and develops overarching criteria for any activities able to prove the manufacture of solutions enabling to make a substantial contribution to the transition to the circular economy. The methodology proposed in regard is novel and adopts a close interpretation of Article 16, where enabling means: 1. Directly used by another taxonomy aligned activity to make a substantial contribution to the environmental objective at stake ; and 2. Materially enabling that other activity to make its substantial contribution.

This is why, additional requirements are proposed to ensure that these two conditions are met.

This objective of this activity is to remain open about the potential existing solutions would enable other sectors to make a substantial contribution to the circular economy.

Given that sometimes, the same equipment can be used in activities which do contribute to making a substantial contribution to the circular economy, and sometimes not, a case-by-case assessment of the activity operator proving that there is a direct and causal link between the equipment and the substantial contribution achieved in another activity.

Where economic activities have the potential to enable substantial circularity benefits in other sectors, these should also be included (assuming the life cycle performance of the activity do not undermine other environmental objectives).

Any machinery or equipment manufacturer or data solution provider could comply with these Technical Screening Criteria. The idea of developing a horizontal set of enabling activities for the transition to the circular economy is to make sure that no equipment or technology is left behind if it enables to make a substantial contribution to the circular economy.

2.13 Manufacture of machinery, equipment and data solutions enabling a substantial contribution to pollution prevention and control

Description of the activity

Manufacture of equipment, machinery and related services, aimed at, and demonstrating a substantial contribution to enabling pollution prevention and control, as defined in article 14 of EU Regulation (EU) 2020/852, where those technologies are not covered in other activities substantially contributing to pollution prevention and control.

The economic activities in this category could be associated with several NACE codes, C25, 26, C27, C28, J61, J.62, J.63 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

An economic activity in this category is an enabling activity in accordance with Article 14(1), point (e), of Regulation (EU) 2020/852 where it complies with the technical screening criteria set out in this Section.

Substantial contribution to pollution prevention and control

The activity manufactures an equipment and/or related services and/or components complying with all of the following:

A. Direct link between the and/or related services and/or components and taxonomy alignment.

The activity directly sells an equipment and/or related services and/or components to an economic operator using it in a taxonomy aligned activity substantially contributing to pollution prevention and control.

Information on clients is provided to the third party verifier and include information derived from primary information from the product user.

The assessment of the independent 3rd party is publicly disclosed (redacting business confidential information.

B. Substantial contribution of the enabling activity:

The activity makes a substantial contribution to the environmental objective, by proving that the equipment and/or related services and/or components is essential and material to achieve the substantial contribution criteria in another activity substantially contributing to pollution prevention and control. In particular, the activity proves that:

1. The use of this equipment always helps make a substantial contribution to pollution prevention and control.
2. For complete machines/systems, it is proven and documented that it is able to fulfil the technical screening criteria of the activity, which is the intended use of the machine/system.
3. For components, it must be proven and documented that these components are the reason why the capabilities of a system with this component is different from conventional systems without this component (e.g. special sensors). Therefore, this does not include standard components used also in systems not able to reach the necessary technical screening criteria

The full assessment is publicly disclosed and 3rd party verified. The 3rd party assessment is publicly disclosed.

Do no significant harm ('DNSH')	
(1) Climate change mitigation	The activity assesses the availability of and, where feasible, adopts techniques that support: - Energy efficiency of the equipment,

	- Minimization of embodied GHG emissions, - For energy-related products, the use of decarbonized energy sources during the product's operation In addition, the manufactured equipment has a life cycle performance above average compared to technologies with a similar purpose currently available on the market. Environmental Impacts are calculated using Recommendation 2013/179/EU. Quantified life-cycle environmental impact reductions are verified by an independent third party which transparently assesses how the standard criteria, including those for critical review, have been followed when the value was derived. The 3rd party assessment is publicly disclosed
(2) Climate change adaptation	DNSH as set out in [Appending A of Annex 1 to the Commission Delegated Regulation (EU) …/… supplementing Regulation (EU) 2020/852]
(3) Sustainable use and protection of water and marine resources	DNSH as set out in [Appending B of Annex 1 to the Commission Delegated Regulation (EU) …/… supplementing Regulation (EU) 2020/852] In addition, the manufactured equipment has a life cycle performance above average compared to technologies with a similar purpose currently available on the market. Environmental Impacts are calculated using Recommendation 2013/179/EU. Quantified life-cycle environmental impact reductions are verified by an independent third party which transparently assesses how the standard criteria, including those for critical review, have been followed when the value was derived. The 3rd party assessment is publicly disclosed
(4) Transition to a Circular Economy	The activity assesses the availability of and, where feasible, adopts techniques that support: (a)reuse and use of secondary raw materials and reused components in products manufactured;

	(b)design for high durability, recyclability, easy disassembly and adaptability of products manufactured; (c)waste management that prioritises recycling over disposal, in the manufacturing process; (d)information on and traceability of substances of concern throughout the life cycle of the manufactured products.
(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in [Appending D of Annex 1 to the Commission Delegated Regulation (EU) …/… supplementing Regulation (EU) 2020/852]

Rationale

This activity is based on Article 16 of Regulation (EU) 2020/852.

On the methodology, these criteria took as a starting point the European Commission Climate delegated act adopted on 4th June 2021, which also lists enabling activities. For instance, for the objective of climate change mitigation, the climate delegated act lists specific manufacturing activities which enable, in their nature, to make a substantial to the climate change mitigation objective (it is for instance the case of renewable energy equipment). It also contains a more 'open' activity whereby the substantial contribution has to be proven, showing substantial GHG emissions reduction using an LCA approach.

This activity builds on the latter and develops overarching criteria for any activities able to prove the manufacture of solutions enabling to make a substantial contribution to the prevention and control of pollution. The methodology proposed in regard is novel and adopts a close interpretation of Article 16, where enabling means: 1. Directly used by another taxonomy aligned activity to make a substantial contribution to the environmental objective at stake ; and 2. Materially enabling that other activity to make its substantial contribution.

This is why additional requirements are proposed to ensure that these two conditions are met.

This objective of this activity is to remain open about the potential existing solutions would enable other sectors to make a substantial contribution to the pollution prevention and control objective.

Given that sometimes, the same equipment can be used in activities which do contribute to making a substantial contribution to the pollution prevention objective, and sometimes not, a case-by-case assessment of the activity operator proving that there is a direct and causal link between the equipment and the substantial contribution achieved in another activity.

Where economic activities have the potential to enable substantial pollution-related benefits in other sectors, these should also be included (assuming the life cycle performance of the activity do not undermine other environmental objectives).

Any machinery or equipment manufacturer, or data solution provider could comply with these Technical Screening Criteria. The idea of developing a horizontal set of enabling activities for pollution prevention and control is to make sure that no equipment or technology is left behind if it enables to make a substantial contribution pollution prevention and control.

2.14 Manufacture of machinery, equipment and solutions enabling a substantial contribution the sustainable use and protection of water and marine resources

Description of the activity

Manufacture of equipment, machinery and related services, aimed at, and demonstrating a substantial contribution to sustainable use and protection of water and marine resources, as defined in article 12 of EU Regulation (EU) 2020/852, where those technologies are not already explicitly covered in other activities substantially contributing to the sustainable use and protection on water and marine resources.

The economic activities in this category could be associated with several NACE codes, C25, 26, C27, C28, J61, J.62, J.63 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

An economic activity in this category is an enabling activity in accordance with Article 12(1), point (e), of Regulation (EU) 2020/852 where it complies with the technical screening criteria set out in this Section.

Substantial contribution to sustainable use and protection of water and marine resources

The activity manufactures an equipment and/or related services and/or components complying with all of the following:

A. Direct link between the and/or related services and/or components and taxonomy alignment.

The activity directly sells an equipment and/or related services and/or components to an economic operator using it in a taxonomy aligned activity substantially contributing to the sustainable use and protection of water and marine resources.

Information on clients is provided to the third party verifier and include information derived from primary information from the product user.

The assessment of the independent 3rd party is publicly disclosed (redacting business confidential information.

B. Substantial contribution of the enabling activity:

The activity makes a substantial contribution to the environmental objective, by proving that the equipment and/or related services and/or components is essential and material to achieve the substantial contribution criteria in another activity substantially contributing to the sustainable use and protection of water and marine resources. In particular, the activity proves that

1. the use of this equipment always helps make a substantial contribution to the sustainable use and protection of water and marine resources
2. For complete machines/systems, it is proven and documented that it is able to fulfil the technical screening criteria of the activity, which is the intended use of the machine/system.
3. For components, it must be proven and documented that these components are the reason why the capabilities of a system with this component is different from conventional systems without this component (e.g. special sensors). Therefore, this does not include standard components used also in systems not able to reach the necessary technical screening criteria

The full assessment is publicly disclosed and 3rd party verified. The 3rd party assessment is publicly disclosed.

Do no significant harm (‘DNSH’)	
(1) Climate change mitigation	The manufactured equipment has a life cycle performance above average compared to technologies with a similar purpose currently available on the market. Environmental Impacts are calculated using Recommendation 2013/179/EU. Quantified life-cycle environmental impact reductions are verified by an independent third party which transparently assesses how the standard criteria, including those for critical review, have been followed when the value was derived. The 3rd party assessment is publicly disclosed The activity assesses the availability of and, where feasible, adopts techniques that support: - Energy efficiency of the equipment, - Minimization of embodied GHG emissions, - For energy-related products, the use of decarbonized energy sources during the product’s operation,
(2) Climate change adaptation	DNSH as set out in [Appending A of Annex 1 to the Commission Delegated Regulation (EU) …/… supplementing Regulation (EU) 2020/852]
(4) Transition to a Circular Economy	The activity assesses the availability of and, where feasible, adopts techniques that support: (a)reuse and use of secondary raw materials and reused components in products manufactured; (b)design for high durability, recyclability, easy disassembly and adaptability of products manufactured;

	(c)waste management that prioritises recycling over disposal, in the manufacturing process; (d)information on and traceability of substances of concern throughout the life cycle of the manufactured products.
(5) Pollution prevention and control	DNSH as set out in [Appending C of Annex 1 to the Commission Delegated Regulation (EU) …/… supplementing Regulation (EU) 2020/852] In addition, the manufactured equipment has a life cycle performance above average compared to technologies with a similar purpose currently available on the market. Environmental Impacts are calculated using Recommendation 2013/179/EU. Quantified life-cycle environmental impact reductions are verified by an independent third party which transparently assesses how the standard criteria, including those for critical review, have been followed when the value was derived. The 3rd party assessment is publicly disclosed
(6) Protection and restoration of biodiversity and ecosystems	D DNSH as set out in [Appending D of Annex 1 to the Commission Delegated Regulation (EU) …/… supplementing Regulation (EU) 2020/852]

Rationale

This activity is based on Article 16 of Regulation (EU) 2020/852.

On the methodology, these criteria took as a starting point the European Commission Climate delegated act adopted on 4th June 2021, which also lists enabling activities. For instance, for the objective of climate change mitigation, the climate delegated act lists specific manufacturing activities which enable, in their nature, to make a substantial to the climate change mitigation objective (it is for instance the case of renewable energy equipment). It also

contains a more ‘open’ activity whereby the substantial contribution has to be proven, showing substantial GHG emissions reduction using an LCA approach.

This activity builds on the latter and develops overarching criteria for any activities able to prove the manufacture of solutions enabling to make a substantial contribution to the sustainable use of water and the preservation of marine and water resources. The methodology proposed in regard is novel and adopts a close interpretation of Article 10, where enabling means: 1. Directly used by another taxonomy aligned activity to make a substantial contribution to the environmental objective at stake ; and 2. Materially enabling that other activity to make its substantial contribution.

This is why additional requirements are proposed to ensure that these two conditions are met.

The objective of this activity is to remain open about the potential existing solutions would enable other sectors to make a substantial contribution to the water objective.

Given that sometimes, the same equipment can be used in activities which do contribute to making a substantial contribution to the water objective, and sometimes not, a case-by-case assessment of the activity operator proving that there is a direct and causal link between the equipment and the substantial contribution achieved in another activity.

Where economic activities have the potential to enable substantial water-related benefits in other sectors, these should also be included (assuming the life cycle performance of the activity do not undermine other environmental objectives).

Any machinery and equipment manufacturer or data solution provider could comply with these Technical Screening Criteria. The idea of developing a horizontal set of enabling activities for the sustainable use and protection of water and marine resourced is to make sure that no equipment or technology is left behind if it enables to make a substantial contribution to the circular economy.

2.15 Manufacture of motor vehicles, trailers and semi-trailers

Description of the activity

This activity includes the manufacture of motor vehicles for transporting passengers or freight. The manufacture of various parts and accessories, as well as the manufacture of trailers and semi-trailers.

The activity is classified under NACE code C.29 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

Substantial contribution to pollution prevention and control

The economic activity shall comply with the criteria under 1A and 1B.

1A. Pollutant emissions resulting from the manufacturing process

1A.i: The activity complies with the following criteria:

a) for passenger cars: total average VOC emissions (as calculated by the solvent mass balance) of between 8-15g VOCs per m2 of surface area (yearly average)

b) for vans: total average VOC emissions (as calculated by the solvent mass balance) of between 10-20g VOCs per m2 of surface area (yearly average)

c) for buses: total average VOC emissions (as calculated by the solvent mass balance) of less than 100g VOCs per m2 of surface area (yearly average)

1A.ii.The activity does not lead to the manufacture, placing on the market or use of:

(a) substances, whether on their own, in mixtures or in articles, listed in Annexes I or II to Regulation (EU) 2019/1021 of the European Parliament and of the Council, except in the case of substances present as an unintentional trace contaminant;

(b) mercury and mercury compounds, their mixtures and mercury-added products as defined in Article 2 of Regulation (EU) 2017/852 of the European Parliament and of the Council;

(c) substances, whether on their own, in mixture or in articles, listed in Annexes I or II to Regulation (EC) No 1005/2009 of the European Parliament and of the Council;

(d) substances, whether on their own, in mixtures or in an articles, listed in Annex II to Directive 2011/65/EU of the European Parliament and of the Council336, except where there is full compliance with Article 4(1) of that Directive;

(e) substances, whether on their own, in mixtures or in an article, listed in Annex XVII to Regulation (EC) 1907/2006 of the European Parliament and of the Council, except where there is full compliance with the conditions specified in that Annex;

(f) substances, whether on their own, in mixtures or in an article, meeting the criteria laid down in Article 57 of Regulation (EC) 1907/2006 and identified in accordance with Article 59(1) of that Regulation, except where their use has been proven to be essential for the society;

(g) other substances, whether on their own, in mixtures or in an article, that meet the criteria laid down in Article 57 of Regulation (EC) 1907/2006, except where their use has been proven to be essential for the society.

1A.iii : Where applicable, vehicles do not contain lead, mercury, hexavalent chromium and cadmium, in accordance with Directive 2000/53/EC of the European Parliament and of the Council or

The activity eliminates the use of lead, mercury, hexavalent chromium and cadmium for all types of vehicles, whilst allowing for exemptions listed in ELV Directive Annex II. NB: exemptions tolerate a maximum concentration of lead, hexavalent chromium and mercury in homogeneous materials of less than 0,1 % by weight, and concentration of cadmium in homogeneous materials is less than 0,01 % by weight; these criteria are today only applicable to passenger cars and small commercial vehicles, and it is proposed to be extended to all vehicles.

1B. Manufacture of low pollutant vehicles

The activity complies with the following criteria:

a) for light duty vehicles:

i) until 31 December 2025, the declared maximum real-driving emission (RDE) values of particles number (PN) in #/km and nitrogen oxides (NOx) in mg/km are no more than 50% of the applicable emission limits laid down in Annex I to Regulation (EC) No 715/2007, or its successors.

ii) from 1 January 2026, indirect emissions of all air pollutants as regulated under Regulation (EC) No 715/2007, or its successors, are zero.

b) for road passenger transport vehicles (buses):

The activity manufactures zero direct tailpipe emissions vehicles

Do no significant harm (‘DNSH’)	
(1) Climate change mitigation	N/A
(2) Climate change adaptation	DNSH as set out in [Appending A of Annex 1 to the Commission Delegated Regulation (EU) …/… supplementing Regulation (EU) 2020/852]
(3) Sustainable use and protection of water and marine resources	DNSH as set out in [Appending B of Annex 1 to the Commission Delegated Regulation (EU) …/… supplementing Regulation (EU) 2020/852]
(4) Transition to a Circular Economy	The activity assesses the availability of and, where feasible, adopts techniques that support: (a) reuse and use of secondary raw materials and re-used components in products manufactured; (b) design for high durability, recyclability, easy disassembly and adaptability of products manufactured; (c) waste management that prioritises recycling over disposal, in the manufacturing process; (d) information on and traceability of substances of concern throughout the life cycle of the manufactured products. In addition Batteries comply with the applicable sustainability rules on the placing on the market of batteries in the Union, including restrictions on the use of hazardous substances in batteries, including Regulation (EC) No 1907/2006 of the European Parliament and of the Council 93 and Directive 2006/66/EC.

	Where applicable, facilities carrying out recycling processes meet the requirements laid down in Directive 2010/75/EU of the European Parliament and of the Council. The activity adopts designs, techniques and practices that: 1. Enable reuse and remanufacturing of vehicle components where possible, and enable re-use, remanufacturing and recycling of at least 85% of vehicles of all types by weight, and recycling and recovery of at least 95% (NB: this amounts to compliance with the 3R Directive (Directive 2005/64), but this only applies to M1 and N1 (small passenger cars and small trucks) at the moment; there are no separate targets now for reuse and recycling. Also, there are no targets for remanufacturing). 2. Do not inhibit re-use, repair or remanufacturing by qualified professional and independent mechanics; 3. Ensure that all necessary information is provided that is necessary for authorised treatment facilities to safely and effectively dismantle a vehicle in compliance with the End-of-Life Vehicle Directive, whilst retaining the maximum residual value in respect of components and materials. (NB: Article 8.3 of the ELV Directive requires that producers provide dismantling information for each type of new vehicle put on the market within six months after the vehicle is put on the market). 4. Ensure that all necessary information is provided that is necessary for authorised treatment facilities to dismantle, store and test components that can be re-used, refurbished or remanufactured, including “locked” parts and parts that can be used in several car models, and particularly in respect of batteries from electric vehicles. (NB:Art. 8.4 provides that manufacturers of components used in vehicles make available to authorised treatment facilities appropriate information concerning dismantling, storage and testing of components which can be used. Imminent review of ELV is expected to strengthen information requirements for re-use and address “locked” parts) 6. Incorporate secondary raw materials and re-used and remanufactured components; 7. Eliminate substances and compounds that are difficult and costly to recycle, where alternatives exist with similar performance; 8. Provides detailed reporting to enable depollution and dismantling of

	batteries, liquids, oil filters, catalysts, metal components, tyres, large plastic p[arts, glass etc..(see table 1 in the Annex of COM DEC 2005/293) 9. Prioritise recycling over disposal in the manufacturing process.
(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in [Appending D of Annex 1 to the Commission Delegated Regulation (EU) …/… supplementing Regulation (EU) 2020/852]

Rationale

The proposed SC for the manufacture of low pollutant vehicles defines performance in relation to an existing environmental target (vehicle Euro emission standards) and takes the principle already established in the Clean Vehicles Directive – requiring a minimum percentage improvement compared to the latest Euro emission standard under RDE.

The pollutant emissions resulting from the manufacturing process concerns mainly the VOCs emitted during the painting and coating phases. It is therefore proposed that the criteria are set in relation to the BAT-AELs for total emissions of VOCs from the coating of vehicles.

Given that the emissions from the use phase have higher impact, the related SC criteria for low pollutant vehicles take priority. Nevertheless, in order for the activity to be considered compliant the criteria for pollutant emissions resulting from the manufacturing process should ensure a high level of performance according to the BAT-AELs. It is proposed, therefore, that along with the SC criteria set for the manufacture of low pollutant vehicles, the activity should respect the BAT-AEL levels relevant for new plants.

As defined in the general principles above, the criteria should be additional, which means that both sets of criteria will have to be fully met.

In the climate mitigation criteria, a car is taxonomy compliant if it is below 50g CO2/km up to 2026, and zero emission after that. As low CO2 emissions are not always a good proxy for low

pollutant emissions, it is important to set ambitious pollutant emission standards in the pollution criteria until 2026.

It is proposed to set criteria based on the Clean Vehicles Directive, which is already used as a reference in the climate mitigation criteria. As well as defining what a clean LD vehicle is by CO2 emissions, it also defines it by pollutant emissions: it must emit no more than 80% of the latest emission limits under RDE (corresponding to 64 mg NOx/km). However, PEMs testing data (source ACEA/JAMA) collected by the AECC (Association for Emissions Control by Catalyst) shows that the latest Euro 6d-temp/6d diesels can emit less than half of the limit both under urban driving and overall RDE driving conditions (i.e. below 40mg NOx/km), with several models emitting levels of NOx lower than 20mg/km. Given the recent technological developments, it will therefore be necessary to set SC criteria for pollution at a more ambitious level than is currently in the CVD. It is proposed to set the limit at no more than 50% of the latest emission limits under RDE (corresponding to 40mg NOx/km). It is proposed to set the limit of ambition as an improvement to the existing pollution limits (Euro 6).

Trucks are not included in this activity for the following reasons: Commission Delegated Regulation (EU) supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council covers the manufacture of trucks already. Current methodologies available to measure pollutants are not certifiable on lower levels than those required in legislation. It was therefore not possible to find the right metric which would provide the correct level of confidence that a substantial contribution to pollution prevention and control would be made.

Regarding DNSH criteria, no requirement is proposed regarding climate change mitigation as to comply with the required tailpipe emission thresholds, the activity must in any case hybridise or completely electrify the manufactured equipment.

It is proposed to not to include trucks for the technical screening criteria for substantial contribution to the manufacture of low pollutant vehicles, as there is no robust way of measuring and ensuring (by certifying) lower emissions of pollutants compared to the maximum legal limit as required for vehicle type approval. It is therefore proposed to fully rely on the Climate mitigation criteria; as there is no methodologically proper way of introducing only tailpipe performance limits. In practice, this means that economic operators can still qualify for taxonomy compliance finance through compliance with the climate mitigation SC criteria.

Prior to this decision, three options were considered for setting technical screening criteria for trucks. Firstly, setting a zero-emission requirement for all new HDVs, however this would be more stringent than the climate mitigation taxonomy (which allows, according to the draft DA, 'low emission trucks' heavier than 7,5tn to be taxonomy compliant), and hence would not respect the 'level playing field' requirement.

Secondly, using both the current Euro VI E pollution standard and the future Euro VII standard as transition phases to ZE trucks. However, this would involve allowing a minimum regulatory standard to be classed as taxonomy compliant for a period of time. As a way round this, it was considered to require a minimum electric range of the vehicle to contribute to pollution reduction in city centres where pollution impact is the heaviest.

It was finally agreed to deprioritise SC criteria for indirect pollution and instead rely on the climate mitigation criteria (which defines a low emission truck exceeding 7,5 tonnes as having less than half (i.e., 50%) of the reference CO2 emissions in their given vehicle sub-group) and – as low CO2 is not always a good proxy for low pollutant emissions – referring also to Euro VI E and its successors in the DNSH criteria for pollution in the climate mitigation delegated act. This will ensure that taxonomy compliant trucks are both low or zero emission and also comply with the latest pollution standard. In addition, low-emission vehicles would require a high degree of hybridisation, and would therefore implicitly enable the reduction of pollution in the urban areas where it is more relevant.

All of the proposed thresholds are measurable and rely on existing standardised methodologies.

2.16 Manufacture of other transport equipment

Description of the activity

Manufacture of motorcycles and other L-type vehicles, trains, sea and coastal freight water transport vessels not dedicated to transporting fossil fuels *and* aircrafts associated with NACE C.30 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

Substantial contribution to transition to pollution, prevention and control

Manufacturing of Motorcycles (and other L-type vehicles):

The activity complies with the two following criteria:

- The activity manufactures zero direct tailpipe pollution emissions vehicle
- Total VOC emissions arising from the manufacturing process are lower than <0.05-0.1 kg VOC per kg of solid mass input (yearly average).

The associated techniques to achieve this VOC emission level include:

- Reduction of solvent content in coatings (e.g., use of WB (water-based) and/or high-solid content coatings),
- Solvent-free thinner and cleaning agents,
- Advance spray application and colour change systems.

Manufacturing of Trains:

The activity complies with the two following criteria:

- The activity manufactures zero direct tailpipe pollution emissions vehicle
- Total VOC emissions arising from the manufacturing process are lower than <0.05-0.1 kg VOC per kg of solid mass input (yearly average).

The associated techniques to achieve this level would include:

- Reduction of solvent content in coatings (e.g. use of WB (water-based) and/or high-solid content coatings),
- Solvent-free thinner and cleaning agents,
- Advance spray application and colour change systems.

Manufacturing of Aircraft:

The activity complies with all of following criteria:

- The activity manufactures aircraft whose emissions limits meet the following air and noise pollution thresholds:
    - nvPM emissions below the ICAO CAEP/10 standard,
    - NOx emissions at least 54% below the ICAO CAEP/8 NOx standard at engine Overall Pressure Ratio=30.

      Noise:

From 2021 to 2026) which achieve the following EPDdB margins to the ICAO Chapter 14 noise standard:

- o Regional aircraft – Margin of at least 13 EPNdB
- o Narrow-body aircraft – Margin of at least 12 EPNdB
- o Wide-body aircraft – Margin of at least 15 EPNdB.

From 2027 to 2036 • aircraft which achieve the following EPDdB margins to the ICAO Chapter 14 noise standard:

- o Regional aircraft – Margin of at least 14.5 EPNdB
- o Narrowbody aircraft – Margin of at least 15.5 EPNdB
- o Widebody aircraft – Margin of at least 19.5 EPNdB.

From 2037) • aircraft which achieve the following EPDdB margins to the ICAO Chapter 14 noise standard:

- o Regional aircraft – Margin of at least 17 EPNdB
- o Narrowbody aircraft – Margin of at least 24 EPNdB
- o Widebody aircraft – Margin of at least 26.5 EPNdB

- Total VOC emissions arising from the manufacturing process are lower than 0.2-0.4 kg VOCs per kg of solid mass input (yearly average). The associated techniques to achieve this level include
  - o reduction of solvent content in coatings (e.g. use two-components and/or high-solid content coatings),
  - o less-solvent-containing thinner and cleaning agents, use of pre-impregnated wipes for cleaning. In this sector, cleaning activities represent the major share of solvent use,
  - o advance spray application system,
  - o enclosed spray application zones with air extraction (note: treatment of extracted air may not be economically feasible), enclosed application zones with extraction and treatment for components

Manufacturing of Ships (passenger):

The activity manufactures sea and coastal passenger water transport vessels, excluding Cruise ships and Super Yacht with crew (vessels over 24 meters long) and complies with all of following criteria:

The activity manufactures either:

a) Vessels with zero direct emissions fleet for Sox, Nox, PM or

b) until 31st December 2025 vessels that are compliant with the general requirements of MARPOL Annex VI for Emission Control Areas (ECA) for SOx, NOx and PM regardless of the area of operation and having zero direct emission technology at berth

AND

2) The activity complies with one or more of the following criteria for oil pollution

a) Vessels that operate at less than 12 miles from shore commit to a zero oily residue discharge from bilge water, stern tube/propeller shaft oil leakage and other oily wash water. Vessels are equipped with specific treatment systems to process bilge water down to 0 ppm and seawater stern tube lubrication systems.

b) Vessels that operate more than 12 miles from the shore are equipped with IBTS (Integrated Bilge Water Treatment System) meeting the requirements of regulation 14 of the MARPOL Annex I and with real-time discharge quality monitoring system. The quality of the discharged bilge water must meet the threshold of 5 ppm oil in the water without dilution.

AND

3) The activity complies with one or more of the following criteria for water pollution

a) Vessels that operate at less than 12 miles from shore commit to a zero discharge of any kind of wastewater (grey and black water). Vessels are equipped with wastewater retention tanks and sewage collection systems to be emptied during stopovers in ports' terminals.

b) Vessels that operate beyond 12 miles from shore are equipped with on board treatments' systems approved by the Administration in accordance with regulation ANNEX 22 RESOLUTION MEPC.227(64) (2012 Guidelines on Implementation of Effluent Standards and Performance Tests for Sewage Treatment Plants) developed for Special Areas, irrespective if they operate within or outside of the Special Area under Annex IV. All waste waters to be treated and discharged only after treatment and only beyond 12 miles from the shore.

AND

4) The activity complies with either one of the following criteria for underwater noise pollution:

a) Vessels larger then 24 meters must implement IMO recommendations from IMO MEPC.1/Circ.833: Guidelines for the Reduction of Underwater Noise from Commercial Shipping to Address Adverse Impacts on Marine Life with proper detailed measures based on the three primary sources of underwater noise, namely on propellers, hull form, on-board machinery, and various operational and maintenance recommendations such as hull cleaning. As result of application of the guidelines, the vessel should achieve minimum 10dB reduction comparing to equivalent vessel and measured in accordance with ISO 17208/2:2019

b) Vessels less than 24 meters long have a maximum sound level of 80 dB to avoid noise disturbance of marine fauna (in line with the requirements for noise emission levels in the essential requirements of the Recreational Craft Directive 2013/53).

AND

The activity manufactures equipment whose design reduces underwater noise technologies; such as:

o Computational Fluid Dynamics (CFD) to predict and visualize flow characteristics around the hull and appendages, generating the wake field in which the propeller operates;

o Propeller analysis methods such as lifting surface methods or CFD for predicting cavitation;

o Statistical Energy Analysis (SEA) to estimate high-frequency transmitted noise and vibration levels from machinery;

o and Finite Element Analysis (FEA) and Boundary Element Method (BEM) to estimate low-frequency noise and vibration levels from the structure of the ship excited by the fluctuating pressure of propeller and machinery excitation.

Manufacturing of Ships (sea and costal freight):

The activity manufactures sea and coastal freight water transport vessels, not intended to transportation of fossil fuels, hazardous waste that are intended for final disposal, nuclear waste, transport of products linked to deforestation (such as soy, timber, palm oil and beef), and complies with all of following criteria:

The activity manufactures either:

a) Zero direct emissions vessels for SOx, NOx, PM

b) Until 31st December 2025 vessels compliant with the general requirements of MARPOL Annex VI plus the requirements for Emission Control Areas (ECA) for SOx2, NOx and PM regardless of the area of operation and having zero direct emission technology at berth.

AND

2) The activity complies with one or more of the following criteria for oil pollution

a) Until 31st of December 2025 Vessels are equipped with IBTS (Integrated Bilge Water Treatment System) meeting the requirements of regulation 14 of the MARPOL Annex I (15ppm) and with real-time discharge quality monitoring system. Proper systems are in place to eliminate stern tube/propeller shaft oil leakage

b) From 1st January 2026 vessels equipped with relevant bilge water treatment systems to achieve oil content of the effluent without dilution of less than 5parts per million. Proper systems are in place to eliminate stern tube/propeller shaft oil leakage

AND

3) The activity complies with one or more of the following criteria for water pollution

a) Vessels that operate at less than 12 miles from shore commit to a zero discharge of any kind of wastewater (grey and black water). Vessels are equipped with wastewater retention tanks and sewage collection systems to be emptied during stopovers in ports' terminals.

b) Until 31st of December 2025 vessels that operate beyond 12 miles from shore are equipped with on board treatments' systems approved by the Administration in accordance with ANNEX 26 Resolution MEPC.159(55) (2006 REVISED GUIDELINES ON IMPLEMENTATION OF EFFLUENT STANDARDS AND PERFORMANCE TESTS FOR SEWAGE TREATMENT PLANTS). All waste waters to be treated and discharged only after treatment and only beyond 12 miles from the shore.

AND

4) The activity complies with either one of the following criteria for underwater noise pollution:

Vessels larger than 24 meters must implement IMO recommendations from IMO MEPC.1/Circ.833: Guidelines for the Reduction of Underwater Noise from Commercial Shipping to Address Adverse Impacts on Marine Life with proper detailed measures based on the three primary sources of underwater noise, namely on propellers, hull form, on-board machinery, and various operational and maintenance recommendations such as hull cleaning. As result of application of the guidelines, the vessel should achieve minimum 10dB reduction comparing to equivalent vessel and measured in accordance with ISO 17208/2:2019 and no higher than 171dB value in quiet cruise conditions at speed of 11knots

AND

the activity manufactures equipment whose design reduces underwater noise technologies; such as:

- Computational Fluid Dynamics (CFD) to predict and visualize flow characteristics around the hull and appendages, generating the wake field in which the propeller operates;
- Propeller analysis methods such as lifting surface methods or CFD for predicting cavitation;
- Statistical Energy Analysis (SEA) to estimate high-frequency transmitted noise and vibration levels from machinery;
- and Finite Element Analysis (FEA) and Boundary Element Method (BEM) to estimate low-frequency noise and vibration levels from the structure of the ship excited by the fluctuating pressure of propeller and machinery excitation.

Manufacturing of Ships (inland freight):

The activity manufactures Inland Freight Transport vessels that are not dedicated to transport of fossil fuels; Transport of solid waste; Transport of hazardous waste that are intended for final disposal; Transport of nuclear waste; Transport of products linked to deforestation soy, timber, palm oil and beef, unless they are provided with deforestation-free supply chain certification.

The activity complies with either one of the following criteria for air pollution:

a) Zero tailpipe direct emissions fleet for SOx, NOx, PM during navigation, operations and at berth

b) Until 2025, vessels compliant with Regulation 2016/1628 (Stage V engine) and zero direct emission at berth.

AND

2. The activity complies with the following criterion for oil pollution:

Zero oil discharge from bilge waters or other sources. Vessels are equipped with storage tanks to be emptied in ports facilities, or if no ports are equipped with relevant facilities in the region, vessels are equipped with appropriate treatment systems to reach 0 ppm oil residue in water discharge. The use of mobile reservoirs stored on deck as reservoirs for the collection of used oil is not included/accepted.

AND

3. The activity complies with the following solid waste criteria:

a) Vessels equipped with facilities for the collection and storage of vessel operation refuse. A separate container must be provided for vessel operation refuse. The volume of household refuse collection facilities Vhr shall be calculated, following the CDNI convention, by the formula Vhr = Ghr x N x T 1

b) Household refuse-collection equipment must have tightly-closing lids and be installed in well-ventilated areas and must have fittings allowing them to be securely attached to the deck, in compliance with the relevant navigation security certificate

c) no incineration is present on board

AND

4. The activity complies with the following noise (above water) criteria:

a) Noise emitted by vessels shall not exceed 70 dB(A) at a lateral distance of 25 m from the shipside.

b) With the exception of trans-shipment operations, the noise emitted by stationary vessels shall not exceed 60 dB(A) at a lateral distance of 25 m from the shipside.

The activity manufactures Inland passenger water transport vessels, excluding Cruise ships and high-speed boats

1. The activity complies with the following criteria for air pollution:

Zero tailpipe direct emissions fleet (SOx, NOx, PM) during navigation, operations and at berth

2. The activity complies with the following criteria for oil pollution: reach 0 ppm oil residue in water discharge

3. The activity complies with the following criteria for water pollution: On-board sewage plants must comply with the following limits during the type test:

4. The activity complies with the following noise (above water) criteria: Noise emitted by vessels under way, in particular engine intake and exhaust noise, shall be damped by appropriate means.Noise emitted by vessels shall not exceed 70 dB(A) at a lateral distance of 25 m from the shipside. With the exception of trans-shipment operations, the noise emitted by stationary vessels shall not exceed 60 dB(A) at a lateral distance of 25 m from the shipside

- In the manufacturing of all marine vessels Total VOC emissions arising from the manufacturing process are lower than 0.3 kg per kg of solid mass input (yearly average).

The associated techniques to achieve this level would include:

- segregation of waste and waste water streams,
- partial of full enclosure of treatment areas (for both preparation and coating processes),
- advanced blasting/stripping processes (e.g. wet blasting, (ultra) high-pressure water blasting, induction heating stripping, underwater hull cleaning),
- reduction of solvent content in coatings (e.g. use two-components, high-solid content or water-based coatings),
- less-solvent-containing thinner and cleaning agents,
- advance spray application system.

For the manufacture of all transport equipment :

the activity does not lead to the manufacture, placing on the market or use of:

(a) substances, whether on their own, in mixtures or in articles, listed in Annexes I or II to Regulation (EU) 2019/1021 of the European Parliament and of the Council333, except in the case of substances present as an unintentional trace contaminant;

(b) mercury and mercury compounds, their mixtures and mercury-added products as defined in Article 2 of Regulation (EU) 2017/852 of the European Parliament and of the Council334;

(c) substances, whether on their own, in mixture or in articles, listed in Annexes I or II to Regulation (EC) No 1005/2009 of the European Parliament and of the Council335;

(d) substances, whether on their own, in mixtures or in an articles, listed in Annex II to Directive 2011/65/EU of the European Parliament and of the Council336, except where there is full compliance with Article 4(1) of that Directive;

(e) substances, whether on their own, in mixtures or in an article, listed in Annex XVII to Regulation (EC) 1907/2006 of the European Parliament and of the Council337, except where there is full compliance with the conditions specified in that Annex;

(f) substances, whether on their own, in mixtures or in an article, meeting the criteria laid down in Article 57 of Regulation (EC) 1907/2006 and identified in accordance with Article 59(1) of that Regulation, except where their use has been proven to be essential for the society;

(g) other substances, whether on their own, in mixtures or in an article, that meet the criteria laid down in Article 57 of Regulation (EC) 1907/2006, except where their use has been proven to be essential for the society

(h) Where applicable, the manufactured components do not contain lead, mercury, hexavalent chromium and cadmium, in accordance with Directive 2000/53/EC of the European Parliament and of the Council

Do no significant harm (‘DNSH’)	
(1) Climate change mitigation	**Manufacturing of Ships (Sea and costal passenger water transport):** The activity complies with one or more of the following criteria:

	(a) the vessels have zero direct (tailpipe) CO2 emissions; (b) where technologically and economically not feasible to comply with the criterion in point (a), until 31 December 2025, hybrid and dual fuel vessels derive at least 25% of their energy from zero direct (tailpipe) CO2 emission fuels or plug-in power for their normal operation at sea and in ports; (c) where technologically and economically not feasible to comply with the criterion in point (a), until 31 December 2025, the vessels have an attained Energy Efficiency Design Index (EEDI)260 value 10% below the EEDI requirements applicable on 1 April 2022, if the vessels are able to run on zero direct (tailpipe) emission fuels or on fuels from renewable sources . **Manufacturing of Ships (Sea and Coastal FREIGHT water transport):** The activity concerns vessels not dedicated to the transport of fossil fuels. 2. The activity complies with one or more of the following criteria: (a) the vessels have zero direct (tailpipe) CO2 emissions; (b) until 31 December 2025, hybrid and dual fuel vessels derive at least 25 % of their energy from zero direct (tailpipe) CO2 emission fuels or plug-in power for their normal operation at sea and in ports; (c) where technologically and economically not feasible to comply with the criterion in point (a), until 31 December 2025, and only where it can be proved that the vessels are used exclusively for operating coastal and short sea services designed to enable modal shift of freight currently transported by land to sea, the vessels have direct (tailpipe) CO2 emissions, calculated using the International Maritime Organization (IMO) Energy Efficiency Design Index (EEDI)247, 50 % lower than the average reference CO2 emissions value defined for heavy duty vehicles (vehicle sub group 5-LH) in accordance with Article 11 of Regulation 2019/1242;

	(d) where technologically and economically not feasible to comply with the criterion in point (a), until 31 December 2025, the vessels have an attained Energy Efficiency Design Index (EEDI) value 10 % below the EEDI requirements applicable on 1 April 2022 if the vessels are able to run on zero direct (tailpipe) CO2 emission fuels or on fuels from renewable sources. **Manufacturing of Ships (Inland Water Passenger):** The activity complies with: zero-tailpipe emissions at berth and 1. The activity complies with one or both of the following criteria: (a) the vessels have zero direct (tailpipe) CO2 emission; (b) until 31 December 2025, hybrid and dual fuel vessels derive at least 50% of their energy from zero direct (tailpipe) CO2 emission fuels or plug-in power for their normal operation. **Manufacturing of Airplanes:** Aircrafts comply with and are certified against the ICAO new -type CO2 standard.
(2) Climate change adaptation	DNSH as set out in [Appending A of Annex 1 to the Commission Delegated Regulation (EU) …/… supplementing Regulation (EU) 2020/852]
(3) Sustainable use and protection of water and marine resources	*This criterion is not in the scope of this call for feedback.*

(4) Transition to a Circular Economy	*This criterion is not in the scope of this call for feedback.*
(6) Protection and restoration of biodiversity and ecosystems	*This criterion is not in the scope of this call for feedback.*

Rationale

As far as the performance of the manufactured equipment in terms of tailpipe emissions, across all activities, it is proposed to go beyond current legislation, aligning with the level of ambition defined in the mitigation taxonomy and is some cases even aligning with the SC definitions.

For pollution impacts arising from the manufacture of the transport equipment, the ambition is slightly more measured, and will require best or better than average performance (depending on the sector and the potential impact) within the existing regulatory framework.

According to the EEA (https://www.eea.europa.eu/data-and-maps/indicators/transport-emissions-of-air-pollutants-8/transport-emissions-of-air-pollutants-8): "Transport is responsible for more than two thirds of all NOx emissions and accounts for a significant proportion (around 10 % or more) of the total emissions of other pollutants. Between 1990 and 2017, the transport sector significantly reduced emissions of the following air pollutants: carbon monoxide and non-methane volatile organic compounds (both by around 87 %), sulphur oxides (66 %) and nitrogen oxides (40 %). Since 2000, a reduction in particulate matter emissions (44 % for PM2.5 and 35 % for PM10) has occurred.

- Shipping accounts for 9% of Transport CO emissions, 14% of NMVOC, 35% of NOx, 34% of PM10, 42% of PM 2.5 and 91% of SOX (2%, 1%, 19%, 4%, 8% and 11% of the total emissions respectively). In addition to air pollution, ships are responsible for water pollution ((ballast, bilge and waste water discharges) and noise pollution with significant impact in the marine ecosystem

- Aviation accounts for 5% of Transport CO emissions, 3% of NMVOC, 13% of NOx, 4% of PM10, 5% of PM 2.5 and 7% of SOx .In addition, noise pollution levels especially around the landing and take-off are significant
- Motorcycles, are responsible for a significant share of the hydrocarbons (HC) and carbon monoxide (CO) emitted by traffic
- The indirect pollution from Rail is comparatively low when compared to other means of transport (1% of Transport CO emissions, 1% of NMVOC, 2% of NOx, 4% of PM10, and 3% of PM 2.5. Nevertheless, it has been included in the exercise as it has a significant potential in alleviating pollution through modal shift from other road transport

However, while emissions of air pollutants have decreased this has not been the case in shipping, for which nitrogen oxide emissions have increased, and aviation, for which emissions of all pollutants (except non-methane volatile organic compounds) have increased. In addition to air pollutants shipping is responsible for water pollutants primarily associated with ballast, bilge and waste water discharges.

The impact from indirect pollution far outweighs the one during the manufacturing activity, and therefore, the focus will be on the activities with the highest impact and highest potential in reducing the impact.

The activity's primary potential is through the manufacture of zero tailpipe emission transport equipment. For shipping and aviation (the two 'hotspot' sectors identified for their relatively high environmental impact), pressure on the environment can be improved through design of more energy efficient vehicles, adoption of zero-emission technologies and low-carbon fuels (e.g. direct electrification where possible on smaller vessels and aircraft, and synthetic and e-fuels for longer range aircraft and ships).

Regarding the manufacturing of inland passenger water transport vessels and inland freight water transport vessels, concerning indirect pollution, it is proposed to rely on the Climate Action mitigation objectives. However, in the Mitigation Delegated act the conformity with applicable regulations of pollution (at minimum Marpol Annex VI) will have to be added at the next revision of the document, as well as the Direct emission standards that represent conformity to best practises.

In addition, the activity has the potential of reducing direct emissions and primarily VOCs from paints during the manufacturing process. (see https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32020D2009&from=EN)

The proposed criteria are performance driven, technology neutral and therefore enable a level playing field.

All of the proposed thresholds are measurable and rely on existing standardised methodologies and metrics.

2.17 Design, manufacture, remanufacture, and reselling of furniture

Description of the activity

Manufacture of furniture. The activity is classified under NACE code C31 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006. It includes manufacture of office and shop furniture, of kitchen furniture, of mattresses, and of other furniture.

Repair of furniture and home furnishings. The activity is classified under NACE code S95.24 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

Retail sale of furniture. Included activities are classified under NACE codes:

- G47.59 Retail sale of furniture, lighting equipment and other household articles in specialised stores,
- G47.79 Retail sale of second-hand goods in stores
- G47.89 Retail sale via stalls and markets of other goods
- G47.91 Retail sale via mail order houses or via Internet

in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006, but only activities that deal with products manufactured in C31 are included.

Substantial contribution to transition to a circular economy

SUMMARY. To contribute substantially to the circular economy, the economic activity complies with one of the following criteria:

A. Resell, refurbish and/or remanufacture furniture already used by a customer. B. Design and produce new furniture in a way that supports extended lifespan through durability, reuse, refurbish, repair and remanufacturing.

C. Design and implement a business model that extends furniture lifespan in practice.

A. Resell, refurbish and/or remanufacture furniture already used by a customer. The economic activity complies with one of the following:

A.1 The economic activity consists of reselling of furniture used before by a customer (household or organisation), possibly after its refurbishment and/or remanufacturing, with a minimum warranty period determined as follows:

- Beds and mattresses: at least 5 years for frame and spring breakage; at least 2 years for the product as a whole.
- Kitchen: at least 5 years.
- Other products: at least 2 years.

The warranty covers repair or replacement for replaced components, during which time goods are ensured to be in conformity with the contract specifications at no additional cost. If applicable, for the guarantee period arrangements need to be made with retailers to add no cost if manufacturers supply the part free-of-charge. If applicable, if the furniture has been refurbished and/or remanufactured before reselling, a substantial part of the furniture components or parts have been retained. Used material and components not reused in the same piece should where possible be reutilised elsewhere, or recycled.

A.2 The economic activity consists of refurbishment and/or remanufacturing services for furniture in use by a customer (household or organisation), with a minimum warranty period determined as follows:

- Beds and mattresses: at least 5 years for frame and spring breakage; at least 2 years for the product as a whole.
- Kitchen: at least 5 years.
- Other products: at least 2 years.

The warranty covers repair or replacement for replaced components, during which time goods are ensured to be in conformity with the contract specifications at no additional cost. If

applicable, for the guarantee period arrangements need to be made with retailers to add no cost if manufacturers supply the part free-of-charge. If applicable, if the furniture has been refurbished and/or remanufactured before reselling, a substantial part of the furniture components or parts have been retained. Used material and components not reused in the same piece should where possible be reutilised elsewhere, or recycled.

B. Design and produce new furniture in a way that supports extended lifespan through durability, reuse, refurbish, repair and remanufacturing. The economic activity complies with one of the following:

B.1 The economic activity leads to a product that is compliant with a relevant internationally recognised type 1 ecolabel, such as the EU Ecolabel for furniture (2016/1332 - *this is the version used in the rest of this document*), the EU Ecolabel for bed mattresses (2014/391/EU - *this is the version used in the rest of this document*), the Nordic Swan Ecolabel for furniture and fitments, and the Blue Angel (The German Ecolabel) for Mattresses or for Low-Emission Furniture and Slatted Frames made of Wood and Wood-Based Materials.

B.2 The economic activity complies with all of the following:

- **Durability**: furniture is designed and produced to last, including minimum performance properties, wear resistance of surfaces and functional properties, as proved by compliance with Nordic Swan Ecolabelling O4-O6 (as relevant), EU Ecolabel for furniture Criterion 9.1, EU Ecolabel for bed mattresses Criterion 12.2, similar relevant internationally recognised type 1 ecolabel or relevant EN furniture standards.

- **Warranty**: a minimum warranty period determined as follows:
    - Beds and mattresses: at least 10 years for frame and spring breakage; at least 5 years for the product as a whole.
    - Kitchen: at least 10 years.
    - Other products: at least 5 years.

  This warranty covers repair or replacement, during which time goods are ensured to be in conformity with the contract specifications at no additional cost. This warranty covers manufacturing faults, but should not cover inappropriate use by the consumer.

- **Spare parts:** Spare parts mean those parts essential to the proper functioning of the furniture piece, which can be installed without specialist knowledge or the use of specialist equipment. Spare parts available to customers for a period determined as follows:
    - Spare parts for beds and mattresses: at least 10 years for frame and spring breakage; at least 5 years for the product as a whole.
    - Spare parts for kitchens: at least 10 years.
    - Spare parts for other products: at least 5 years.

  As calculated from the date of delivery of the new product. The spare part offered does not have to be identical to the original part but must be able to replace the original part and fulfil its function. Information about spare parts must be communicated to the customer. Within the warranty period of the product spare parts must be offered at no extra cost. Compliance is proven by provision of a description of parts that are important for the product's function, which spare parts are offered and how this is communicated to the customer, e.g. by compliance with EU Ecolabel Criterion 9.3 or Nordic Swan Ecolabelling O8, or similar ecolabel

- **Disassembly & reassembly: f**or furniture consisting of multiple component parts/materials, the product shall be designed for disassembly and reassembly with a view to facilitating reuse, refurbish, repair and remanufacturing. Simple and illustrated instructions regarding the disassembly and replacement of damaged component parts/materials shall be provided. Disassembly and replacement operations shall be capable of being carried out using common and basic manual tools and unskilled labour (as in line with Article 4 of EU Regulation 2019/2020). The economic activity complies with the following:
    - Technical drawings that illustrate how the furniture can be assembled/disassembled using identified basic tools and unskilled labour must be provided digitally and should accompany the product (e.g. through compliance with EU Ecolabel Criterion 9.4 or Nordic Swan Ecolabelling O10 or O11, or similar relevant internationally recognised type 1 ecolabel). The information must be available for download on the manufacturer's or retailer's website for a minimum of 10 years after the product has been discontinued.
    - Proof of compliance with circular design requirements, for example such as those described in the Nordic Swan Ecolabelling O15, or a similar relevant internationally recognised type 1 ecolabel
- **Hazardous chemicals:** The economic activity complies with the following:

- (1) The manufacturer does not intentionally use chemical products in producing furniture which contain any substances meeting at least one of the following criteria:
    - Persistent according to REACH Annex XIII (Regulation EC 1907/2006),
    - Hazardous to humans, the environment or the ozone layer according to CLP Annex I parts 2-5 (Regulation EC 1272/2008)
    - Endocrine disruptors (ED) according to the BPR (EC Regulations 528/2012 and 2017/2100) or PPPR (EC Regulation 1107/2009),
    - Properties of equivalent concern in line with Reach Art. 57 (f) (Regulation EC Com 1907/2006)
- As a derogation from sub-criterion (1) in the previous bullet, regarding formaldehyde:
    - Formaldehyde emissions of furniture components and materials must not be more than 65% of the E1 level for MDF (as defined in EN 13986: emissions below 0.124 mg/m3 according to test method EN 717-1), and 50% of the E1 level for particle board
    - The content of free formaldehyde in adhesives or used for surface treatment must not exceed 0.2% by weight (2,000 ppm), as shown on the safety data sheets. The requirement applies to the adhesive before any mixture with a hardener.
    - The content of free formaldehyde (from formaldehyde not intentionally added or from formaldehyde-releasing substances) for remaining chemicals or materials must not exceed 0.02% by weight (200 ppm).
- If applicable, the padding material shall comply with the EU Ecolabel criteria, or any other internationally recognised type 1 eco-label.

A list with all surface treatment substances used for each material present in the furniture and their Safety Data Sheet or equivalent technical documentation demonstrating compliance with the above criteria.

- **VOC emissions:** The furniture item is compliant with all relevant VOC requirements mentioned in one of the following internationally recognised type 1 ecolabels:
    - EU Ecolabel for furniture or the EU Ecolabel for bed mattresses
    - Nordic Swan Ecolabel for furniture and fitments
    - Blue Angel for Mattresses or for Low-Emission Furniture and Slatted Frames made of Wood and Wood-Based Materials

- **Transparency on material content: T**ransparency on material content and product composition, and clarity on suitability for reuse, remanufacturing and/or recycling is shown by adherence to the Sustainable Products Initiative regulations, or an EU material passport when available.
- **Sourcing.** Producing furniture with at least 70% of total product weight made of recycled materials, responsibly sourced renewable materials, or a combination of both, according to following definitions:
    - **Recycled materials**: Recycled material is defined according to ISO 14021 in the category of postconsumer material and includes both mechanical and chemical recycling. ISO 14021 defines post-consumer material as material generated by households or by commercial, industrial and institutional facilities in their role as end users of the product which can no longer be used for its intended purpose. This includes returns of material from the distribution chain. It excludes pre-consumer material (e.g. production scrap).
    - **Responsibly sourced renewable materials:**
        - **Wood, wood fibres or wood particles** should stem from forests that are verified as being managed so as to implement the principles and measures aimed at ensuring sustainable forest management as defined by intergovernmental definition such as Forest Europe H1 resolution embedded and implemented in existing national forest and nature legislation.
        - **Cotton, wool or other natural fibres used in the textiles** should be derived from organic production by being certified as organic or in transition to organic (see below) in compliance with a standard endorsed by IFOAM Family of Standards, such as Regulation (EU) 2018/848, USDA National Organic Program (NOP), APEDA's National Programme for Organic Production (NPOP), China Organic Standard GB/T19630, Organic Content Standard (OCS) from Textile Exchange, or equivalent. The Global Organic Textile Standard (GOTS) and the Demeter Biodynamic Farm Standard are also accepted and are certified as "in transition to organic production". The certification body must have a valid and recognised accreditation for the standard it certifies against, for example, ISO 17065, NOP or IFOAM.
        - **Other renewable materials,** which are materials that are composed of biomass from a living source and that can be continually replenished, or from a source which is continually replenished by nature. When claims

of renewability are made for virgin materials, those materials shall come from sources that are replenished at a rate equal to or greater than the rate of depletion. Certification must be internationally recognised, such as the ISCC PLUS Certification for the Circular Economy and Bioeconomy, or the RSB Global Advanced Products Certification

Compliance is proven by appropriate documentation where the share (by weight) of recycled content and/or renewable content is stated with the evidence on the origin in line with the above points.

C. Design and implement a business model that extends lifespan in practice. The economic activity complies with:

C.1. The business model provides the customer with access to and use of the furniture, while ensuring the ownership remains with the furniture manufacturer or with an alternative company providing such a service (e.g. a specialist or a retailer). Furniture is offered as a service through, e.g. subscription or renting models. This can be proven by providing a copy of the contract used for the economic activity showing that the customer pays for use of the furniture, the manufacturer or alternative company remains owner of the piece of furniture, and the manufacturer or alternative company is obliged to take back the furniture after the contract period.

C.2. The business model leads to extended lifespan in practice, with furniture pieces offered through this business model having a lifespan of at least twice the EU average for that product category (accounting for differences between B2B and B2C contexts).

Do no significant harm ('DNSH')

(1) Climate change mitigation	For new furniture items, greenhouse gas emissions from the production processes of the furniture (calculated in accordance with Regulation (EU) 2019/331)) are lower than [the median value of the data collected in the context of establishing the EU ETS industrial benchmarks for the period of 2021-2026] as measured in tCO2e per tonne of furniture item produced.

	If the company has on-site generation of heat/cool or co-generation including power, the direct GHG emissions of the activity are lower than 270 gCO2e/kWh.
(2) Climate change adaptation	DNSH as set out in [Appending A of Annex 1 to the Commission Delegated Regulation (EU) …/…]
(3) Sustainable use and protection of water and marine resources	• Generic criteria for DNSH to sustainable use and protection for water and marine resources as laid out in Appendix B to Annex I on Climate Change Mitigation. • Environmental degradation risks related to preserving water quality and avoiding water stress are identified and addressed, in accordance with a water use and protection management plan, developed in consultation with relevant stakeholders[1]. • Where the activity involves water abstraction, a permit for water abstraction has been granted by the relevant authority for the activity, specifying conditions to avoid significant impact on water bodies. (Source: CA DA) • The measures mentioned do not lead to an increase in pesticide use and to water pollution, in line with Directive 2009/128/EC and Regulation (EC) No 1107/2009, Integrated Pest Management promotes the use of low pesticide use. [1] *As required by Directive 2000/60/EC for activities subject to Union law or as required by equivalent national provisions or international standards addressing environmental degradation risks related to preserving water quality and avoiding water stress for activities in third countries.* *Where an Environmental Impact Assessment is carried out in accordance with Directive 2011/92/EU and includes an assessment of the impact on water in accordance with Directive 2000/60/EC, no additional assessment of impact on water is required, provided the risks identified have been addressed.*
(5) Pollution prevention and control	• Generic criteria for DNSH to pollution prevention and control as laid out in Appendix C to Annex I on Climate Change Mitigation.

	• If there is on-site generation of heat/cool or co-generation with power, then emissions are within or lower than the emission levels associated with the best available techniques (BAT-AEL) ranges set out in the best available techniques (BAT) conclusions for large combustion plants. No significant cross-media effects occur. For combustion plants greater than 1 MW thermal input but below the thresholds for the BAT conclusions for large combustion plants to apply, emissions are below the emission limit values set out in Annex II, part 2, to Directive (EU) 2015/2193. • For criterion B. regarding the design and production of new furniture: components and materials used in furniture emit less than 0,001 mg of categories 1A and 1B carcinogenic volatile organic compounds per m3 of material or component, upon testing in accordance with CEN/TS 16516 and ISO 16000-3523 or other comparable standardised test conditions and determination methods. • The manufacturer uses chemicals in accordance with existing EU and national directives and legislation such as 2010/75/EU on industrial emissions (integrated pollution control; 89/391/EWG (Aenderungesverordnungen; Arbeitsschutz); 89/654/EEC (Health and Safety requirements;(EU2017/2398 Amending Directive 2004/37/EC (Protection of workers from risk of exposure to carcinogens or mutagens at work; (EU)1272/2008 (classification, labelling and packaging of substances and mixtures); (EU)1907/2006 (REACH). If applicable: if wood based panels production and/or downstream wood processing, preservation, lamination, surface treatment or impregnation is performed on-site, then emission levels are within or lower than the emission levels associated with the best available techniques (BAT-AEL) ranges set out in the best available techniques (BAT) conclusions for wood based panels and/or the BAT conclusions surface treatment

	using organic solvents including preservation of wood and wood productions with chemicals. No cross-media effects occur.
(6) Protection and restoration of biodiversity and ecosystems	Generic criteria for DNSH to protection and restoration of biodiversity and ecosystems as laid out in Appendix D to Annex I on Climate Change Mitigation. **Sourcing of raw materials:** • Any wood raw materials should be sourced from responsible forest management as defined by intergovernmental definition such as forest Europe H1 resolution and embedded and implemented in existing national forest and nature legislation or market based voluntary systems such as, the Forest Stewardship Council (FSC) scheme or PEFC, with additional due diligence for any high-risk sources as defined by the EUTR and guided by the provisions of the Renewable Energy Directive 2. • Any biomass used for the furniture should comply with the sustainability requirements of the EU regulatory framework i.e. EU Forest Strategy, EU Forest Law Enforcement Governance and Trade (FLEGT), EU Timber Regulation (EUTR 995/2010), LULUCF Regulation (841/2018), as applicable. **The physical boundaries of the activity itself:** • An Environmental Impact Assessment (EIA) or screening has been completed, for activities within the Union, in accordance with Directive 2011/92/EU of the European Parliament and of the Council . For activities in third countries, an EIA has been completed in accordance with equivalent national provisions or international standards. • Where an EIA has been carried out, the required mitigation and compensation measures for protecting the environment are implemented. • For sites/operations located in or near biodiversity-sensitive areas (including the Natura 2000 network of protected areas,

	UNESCO World Heritage sites and Key Biodiversity Areas, as well as other protected areas), an appropriate assessment , where applicable, has been conducted and based on its conclusions the necessary mitigation measures are implemented

Rationale

DESCRIPTION RATIONALE

Around a quarter of the world's furniture is manufactured within the European Union, representing an EU28 consumption of ~10.5 million tonnes of furniture per annum, estimated to be representing 2-5% of MSW in the EU28. Whilst reuse of furniture is common, this tends to be on a small scale and with local social goals in mind rather than larger scale environmental and economic ones, and furniture remanufacturing accounts for less than 2% of the EU manufacturing turnover. Average furniture lifespan gets shortened through lack of collection for reuse/remanufacturing, limited design for remanufacturing, and current business models supporting linear throughput.

Inclusion of C31. The whole division is selected as all indicated furniture products – and thus all included economic activities have potential to substantially contribute to the transition to a circular economy by designing and manufacturing new furniture to enable reuse and remanufacturing.

Inclusion of S95.24. In addition, as reuse, repair and remanufacturing can extend lifespan of existing furniture items, it is important for keeping furniture items in the economy, and so substantially contribute to the circular economy. Firms that provide remanufacturing services to restore used goods to original working condition are considered producers of remanufactured goods.

Inclusion of G47.59, G47.79, G47.89, G47.91 to the extent only that they dealt with products manufactured in C31. Finally, circular business model can extend lifespan of new and existing furniture, and so substantially contribute to the circular economy. So given the

importance of reuse and new circular business models, retail sale of new and second-hand furniture has been included too.

TECHNICAL SCREENING CRITERIA RATIONALE

General

- 10 million tonnes of furniture are discarded by businesses and consumers in EU Member States each year, the majority of which is destined for either landfill or incineration.

- Average furniture lifespan gets shortened through lack of collection for reuse/remanufacturing, limited design for remanufacturing, and current business models supporting linear throughput

- SC can be achieved in three different ways:

A. Extending lifespan of existing furniture items through reuse and remanufacturing

B. Designing and manufacturing new furniture to enable reuse and remanufacturing

C. Extending lifespan of new and existing furniture through circular business models

A. Extending lifespan of existing furniture items through reuse and remanufacturing

- Reselling, reuse, refurbish and remanufacturing can extend lifespan of existing furniture items, and facilitates collection of the furniture.

- Warranty periods based on relevant EU Ecolabel and Nordic Swan, taking into account furniture items have already been used, justifying a lower warranty period (currently determined at 50% of the period for a new product in the same category, and rounding up to 1 year)

- The criteria:

- Enable collection of used furniture, TR Art 13 (e) & (g)
- Extend product and component lifespan directly, by collecting, reselling and remanufacturing furniture items, TR Art 13 (e) & (g)
- Reduce the use of primary materials, with % ensuring SC in this regard (closing loopholes), TR Art 13 (a)

B. Designing and manufacturing new furniture to enable reuse and remanufacturing

- New furniture designed fit for a circular economy will help extending lifespan, and enable reuse and remanufacturing

- SC can be achieved through compliance with a relevant internationally recognised type 1 ecolabel (e.g. EU Ecolabel, Nordic Swan Ecolabel, Blue Angel), or through compliance with a list of individual technical criteria based on such ecolabels. The former covers the relevant aspects to ensure SC, such that ecolabel compliance is deemed sufficient. The latter allows economic activities to focus on the subset of the ecolabel criteria that is most relevant for SC to the circular economy, ensuring compliance with an ecolabel is not required.

- Warranty periods based on relevant EU Ecolabel and Nordic Swan ecolabel.

- The criteria:

- Enable lifespan extension, reuse and recycling by creating transparency on material content, TR Art 13.1.(h) and (l)
- Enable extension of product and component lifespan through better design, TR Art 13 (b)
- Extend safe and functional lifespan of furniture products by substantially reducing the content in products and materials of hazardous substances and substituting substances of very high concern in materials and products, TR Art 13.1.(d)
- Reduce the use of primary materials, with % ensuring SC in this regard (closing loopholes), TR Art 13 (a)

Language, thresholds and definitions based on existing EU chemicals legislation, EU Ecolabel, Nordic Swan, ISO standards (e.g. 14021:2016)

C. Extending lifespan of new and existing furniture through circular business models

- Through circular business models lifespan of both new and existing furniture can be extended. When ownership remains with the manufacturer / retailers, circular design, collection and reuse are incentivised.

- In order to keep environmental integrity by avoiding unintended consequences of new business models, the criterion on extended lifespan in practice has been added.

- The criteria:

- Enable collection of used furniture, TR Art 13 (e) & (g)

- Enable extension of product and component lifespan through better design, TR Art 13 (b)
- Extend product and component lifespan directly, TR Art 13 (e) & (g)

2.18 Manufacture of food products and beverages (making a substantial contribution to biodiversity)

Description of the activity

Manufacture of food products. The activity is classified under NACE code C10 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006. Activity 'Manufacture of prepared animal feeds' classified under NACE code C10.9 has been excluded from the scope.

Manufacture of Beverages. The activity is classified under NACE code C11 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

Substantial contribution to transition to the Protection and restoration of biodiversity and ecosystems

SUMMARY:

In order to contribute substantially, the economic activity has to comply with one of the following:

A. Selection of ingredients for which primary production practices improve biodiversity.
B. Selection of protein-rich ingredients that reduce pressure on biodiversity by substituting protein-rich ingredients that have high negative impact on biodiversity.
C. Selection of ingredients that contribute to conservation of critical, endangered, or vulnerable species (i.e. facilitating genetic diversity).

For Option B. and Option C. **"**C10.2 Processing and preserving of fish, crustaceans and molluscs" is excluded from the scope.

A. Selection of ingredients for which primary production practices improve biodiversity. The economic activity has to comply with the following criteria:

The food product or beverage consists for at least 95% by weight of ingredients sourced in way that their production practices improve biodiversity and ecosystem health, by complying with the following:

- For plant-based ingredients, their production practices are classified in the statistical classification of economic activities established by Regulation (EC) No 1893/2006, under the NACE code A1.1 ('Growing of non-perennial crops'), A1.2 ('Growing of perennial crops') or A1.50 ('Mixed farming'), and comply with the corresponding EU Taxonomy criteria for substantial contribution to biodiversity.

- For animal-based ingredients, their production practices are classified in the statistical classification of economic activities established by Regulation (EC) No 1893/2006, under the NACE code A1.4 ('Animal production'), A1.50 ('Mixed farming'), A3.11 ('Marine fishing'), or A3.12 ('Freshwater fishing'), and comply with the corresponding EU Taxonomy criteria for substantial contribution to biodiversity. In case of A1.4, the activity complies with EU Taxonomy criteria under the header 'Improving biodiversity via extensive grazing in landscapes where grazing is beneficial for biodiversity'.

In order to determine this share added water and cooking salt shall not be taken into account.

B. Selection of protein-rich ingredients that reduce pressure on biodiversity by substituting protein-rich ingredients that have high negative impact on biodiversity. The economic activity has to comply with the following criteria:

- **Inclusion of protein-rich ingredient(s) with low negative impact on biodiversity.** The food product or beverage consists for at least 20% by weight of protein-rich ingredient(s) that comply with at least one of the following:
    - The ingredient is mentioned in Table 1 (see Supplementary Material section below)
    - The ingredient's combined direct and indirect land use is on average below 10m^2 per 100g of product protein (see calculation method in Supplementary Material section below)

- **Limitation of protein-rich ingredient(s) with high negative impact on biodiversity.** The food product or beverage consists for at most 3% by weight of protein-rich ingredient(s) that comply with the following:
    - The ingredient is not mentioned in Table 1 (see Annex 1)
    - The ingredient's combined direct and indirect land use is on average above 10m2 per 100g of product protein (see calculation method in Annex 1)

Where an ingredient is called **protein-rich** if at least 12% of the energy value of the ingredient is provided by protein, as determined in EU Regulation (EC) No 1924/2006. In order to determine the above shares added water and cooking salt shall not be taken into account.

C. Selection of ingredients that contribute to conservation and genetic diversity. The economic activity has to comply with the following criteria:

At least 50% of the ingredients by weight are from plants and/or animals for which the following holds:

- If animal-based, the ingredient is sourced from production practices that are classified in the statistical classification of economic activities established by Regulation (EC) No 1893/2006, under the NACE code 1.4 (Animal production), and comply with the following set of EU Taxonomy criteria: 'Farming a rare breed that contributes to critical, endangered, or vulnerable species erosion (i.e. facilitating genetic diversity)', which is the relevant criterion from 'SC to the protection and restoration of biodiversity & ecosystems' for 'Animal production'.

- If plant-based, the ingredient complies with all of the following:
    - The ingredient complies with at least one of the following: The plant variety is a 'conservation variety' (in the meaning of Directive 2008/62/EC), part of an 'organic heterogeneous material' (as defined in Art. 3 (18) of Regulation 2018/848) or an 'organic variety suitable for organic production' (as defined in Art. 3 (19) of Regulation 2018/848).
    - The ingredient does not create the threat of invasive species (animals or plants).

Supplementary Material

Land use is measured in meters squared (m²) per 100 grams of protein. (Source: Data published by, Poore, J., & Nemecek, T. (2018). *Reducing food's environmental impacts through producers and consumers*. Science, 360(6392), 987-992. Link, https://science.sciencemag.org/content/360/6392/987)

Table 1: Combined direct and indirect land use per 100g protein across ingredients.

Data is based on the largest meta-analysis of food system impact studies to date, from Poore & Nemecek's 2018 Science study. The authors note the following about the scope of the studies included in this meta-analysis: "*We derived data from a comprehensive meta-analysis, identifying 1530 studies for potential inclusion, which were supplemented with additional data received from 139 authors. Studies were assessed against 11 criteria designed to standardize methodology, resulting in 570 suitable studies with a median reference year of 2010. The data set covers ~38,700 commercially viable farms in 119 countries and 40 products representing ~90% of global protein and calorie consumption*'. All comparisons here are based on the global mean value per food product across all studies.

Ingredient	Average land use per 100g protein (m^2)
Nuts	7.9
Other Pulses	7.3
Poultry Meat	7.1
Oatmeal	5.8
Eggs	5.7
Grains	4.6
Rice	3.9
Groundnuts	3.5

Peas	3.4
Root Vegetables	3.3
Wheat & Rye	3.2
Maize	3.1
Tofu (soybeans)	2.2

Method for Land Use Calculation

- **For Temporary and Permanent Crops**

$$Land\ Use = \frac{10{,}000}{Yield} * \frac{Seed + Yield}{Yield} * \frac{Crop\ Duration}{365} * \frac{Rotation\ Duration}{Cultivated\ Duration}$$

where $Land\ Use$ is the area occupied to produce 1 kg of product, in m2·year, $Yield$ and $Seed$ are in kg ha–1 and are on the same marketable weight basis (e.g., 15% moisture post field losses), and the $Duration$ terms are in days. For temporary crops, yields for all studies included here, and in most statistical datasets (4), represent output per harvest, not output per year. Where multiple cropping occurs, a time-based allocation was used to apportion land use between crops in the rotation, as $Crop\ Duration$ /365 where $Crop\ Duration$ ≤365 represents the time from crop preparation to the beginning of preparation for the next crop. For permanent crops, excluding orchard crops, yield represents life-cycle yield from establishment to eradication, and $Crop\ Duration$ was set to 365.

$Rotation\ Duration$ is the duration of the whole rotation including marketed crops and fallow, and $Cultivated\ Duration$ is the period cultivated with marketed crops. The difference between these terms is the fallow period.

- **For Orchards Crops**

$$Land\ Use = \frac{10,000}{Yield} \cdot \frac{Cultivated\ Duration}{Bearing\ Duration} \cdot Nursery \cdot \frac{Rotation\ Duration}{Cultivated\ Duration}$$

where *Yield* represents the period when the orchard is bearing marketed fruit (*Bearing Duration*), consistent with FAOSTAT (*82*). *Cultivated Duration* represents the period from orchard establishment to removal. The difference between *Bearing Duration* and *Cultivated Duration* is the non-bearing period after establishment, typically 1-4 years. The fallow period after orchard removal and before replanting is *Rotation Duration/Cultivated Duration*.

For orchard crops seed is not significant, but the nursery period is. The additional area required for the nursery stage per kilogram of product was calculated as:

$$Nursery = 1 + \frac{Nursery\ Duration/365}{Sapling\ Yield} \cdot \frac{Orchard\ Density}{Cultivated\ Duration}$$

where *Nursery Duration* is the time from planting seedlings to the sale of marketable trees (in days); *Sapling Yield* is the number of marketable saplings produced per hectare per year; and *Orchard Density* is the number of trees required for 1 ha of mature orchard.

- **For Animal Products**

For animal products, direct and indirect land use are combined into one figure. For the indirect land use calculation, the land used for feed should use feed crops that used most land with the per default values set in Table 1. Imported feed needs to have a zero-deforestation certification to exclude any indirect land use change.

Do no significant harm ('DNSH')

(1) Climate change mitigation	• If the activity uses on-site generation of heat/cool or co-generation including power, the direct GHG emissions of that

activity are lower than 270 gCO2e/kWh.

- Provision of transparency on greenhouse gases emitted during the food/beverage manufacturing processes for the final food/beverage product, expressed in kgCO_2eq per kilogram of food/beverage product.

- Limitation of protein-rich ingredient(s) with high GHG emissions. The food product or beverage consists for at most 3% by weight of protein-rich ingredient(s) that comply with the following:
    - The ingredient is not mentioned in Table 1 (see Annex 1)
    - The ingredient's combined direct and indirect greenhouse gas emissions are on average above 5kg CO_2eq per 100g of product protein (see calculation method in annex 1)

- Production activities that yield the food or beverage product's ingredients comply with the following criteria:
    - (a) permanent grassland is maintained (In accordance with GAEC 1 of Annex II to Regulation (EU) No 1306/2013);
    - (b) wetland and peatland are appropriately protected (In accordance with GAEC 2 of Annex II to Regulation (EU) No 1306/2013);
    - (c) arable stubble is not burnt, except where an exemption has been granted for plant health reasons (In accordance with GAEC 3 of Annex II to Regulation (EU) No 1306/2013);
    - (d) minimum land management under tillage, including on slopes (In accordance with GAEC 6 of Annex II to Regulation (EU) No 1306/2013).
    - (e) activity does not involve the degradation of land with high carbon stock

	• Continuously forested areas, namely land spanning more than one hectare with trees higher than five meter and a canopy cover of between 10 and 30% or able to reach those thresholds in situ (In accordance with Article 29, paragraphs 4 and 5, of Directive (EU) 2018/2001. This requirement applies to all perennial crop production, whether for biofuels, bioliquids or biomass, or for food or feed uses), are not converted. No use of peat – e.g. as growing medium, fertilizer, animal bedding, etc.
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) …/…]
(3) Sustainable use and protection of water and marine resources	• Generic criteria for DNSH to sustainable use and protection for water and marine resources as laid out in Appendix B to Annex I on Climate Change Mitigation. • The waste water discharge from the food processing stage must be within the BAT defined per unit parameters, where applicable, or follow the BAT recommended techniques, methods and equipment for the use of water, for activities where per unit parameters are not defined.
(4) Transition to a circular economy	The economic activity is driving a reduction of food/beverage loss and waste by compliance with all of the following criteria: • **2030 reduction targets for food/beverage loss & waste at the processing step are set and made public,** such as via the company website, with a reduction target of at least 50% compared to a 2016 baseline, or more recent if not applicable. • **At least 3 of the following criteria are implemented:** o Monitoring, measuring and reporting on food/drink loss and waste quantities through an environmental management system in order to identify and take action on hotspots

	o Integration of food/beverage loss & waste prevention considerations and targets throughout the business/supply chain, including into planning/forecasting of raw material buying o Development of sales of co-products and/or creation products that utilise such co-products by transforming them into new ingredients, food, feed or fertiliser o Improvement of date marking practices and consumer understanding of date marking and other relevant food information o Provision of on-label and/or online information to consumers about better food management Where food surpluses cannot be avoided, prioritisation of food redistribution to humans before facilitating safe food to feed transition
(5) Pollution prevention and control	• Generic criteria for DNSH to pollution prevention and control as laid out in Appendix C to Annex I on Climate Change Mitigation. • Emissions are at least within the emission levels associated with the best available techniques (BAT-AEL) ranges set out in the best available techniques (BAT) conclusions for the [308]. No significant cross-media effects occur. • If there is on-site generation of heat/cool or co-generation with power, then emissions are within or lower than the emission levels associated with the best available techniques (BAT-AEL) ranges set out in the best available techniques (BAT) conclusions for large combustion plants. No significant cross-media effects occur, or: for combustion plants greater than 1 MW thermal input but below the thresholds for the BAT conclusions for large combustion plants to apply, emissions are below the emission

[308] Industrial Emissions Directive 2010/75/EU (Integrated Pollution Prevention and Control)

	limit values set out in Annex II, part 2, to Directive (EU) 2015/2193.
(6) Protection and restoration of biodiversity and ecosystems	Generic criteria for DNSH to protection and restoration of biodiversity and ecosystems as laid out in Appendix D to Annex I on Climate Change Mitigation. For sites/operations located in or near to biodiversity-sensitive areas (including the Natura 2000 network of protected areas, UNESCO World Heritage sites and Key Biodiversity Areas (KBAs), as well as other protected areas), ensure that an appropriate assessment has been conducted in compliance with the provisions of the EU Biodiversity Strategy (COM (2011) 244), the Birds (2009/147/EC) and Habitats (92/43/EEC) Directives or in the case of activities located in non-EU countries, other equivalent national provisions or international standards (e.g. IFC Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources) – based on the conservation objectives of the protected area. Production practices of the ingredients used in the food/beverage are classified in the statistical classification of economic activities established by Regulation (EC) No 1893/2006, under the NACE code 1.1 (Growing of non-perennial crops), 1.2 (Growing of perennial crops), 1.4 (Animal production) and 1.50 (Mixed farming), and comply with the relevant parts of the EU Taxonomy criteria for the respective NACE codes and substantial contribution to biodiversity covering the following areas: • Planning • Minimising habitat loss or conversion • Providing space and resources for native species & biodiversity (habitat, breeding or nesting site, feed) • Soil management • No direct harm to biodiversity • Chemical use • Hydrological factors

	• Animal welfare

Rationale

DESCRIPTION RATIONALE

Manufacturing of food and beverages requires choices on ingredient selection that can directly affect primary production (incl growing of non-perennial and perennial crops, animal production, and marine fishing) in both the way farming is happening and what type of ingredients get produced. Hence, these activities can have a substantial contribution to biodiversity, by directly contributing to TR Art 15 1. (c) *sustainable agricultural practices, including those that contribute to enhancing biodiversity or to halting or preventing the degradation of soils and other ecosystems, deforestation and habitat loss*; While its potential impact has been recognised, the manufacturing of prepared animal feeds (classified under NACE code C10.9) has been excluded from the scope, as the context differs from the food setup, and criteria would have to look too different.

TECHNICAL SCREENING CRITERIA RATIONALE

General

The three criteria focus on ingredient selection by the food & beverage manufacturer as a key driver for substantial contribution to biodiversity.

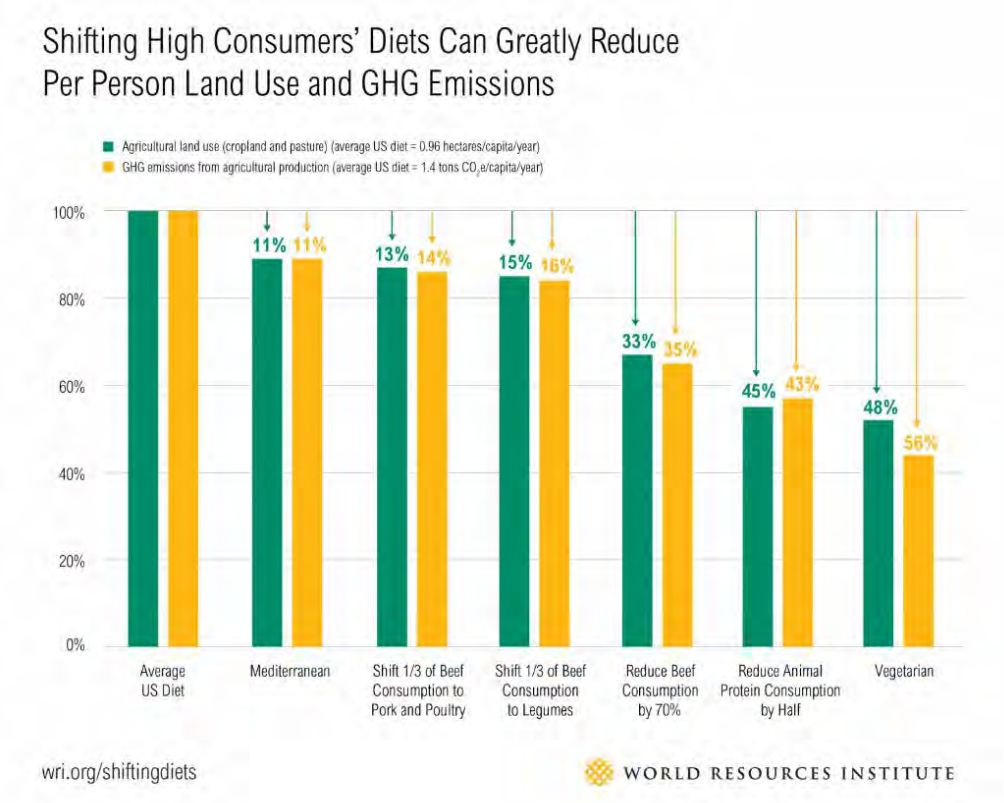
- **"Dietary change can deliver environmental benefits on a scale not achievable by producers**. Moving from current diets to a diet that excludes animal products has transformative potential, reducing food's land use by 3.1 billion ha (a 76% reduction), including a 19% reduction in arable land; food's GHG emissions by 6.6 billion metric tons of CO2eq (a 49% reduction); acidification by 50%; eutrophication by 49%; and scarcity-weighted freshwater withdrawals by 19% for a 2010 reference year." (J. Poore, T. Nemecek, Science, *Reducing food's environmental impacts through producers and consumers* (2018))
- "**If European diets were in line with dietary recommendations, the environmental footprint of food systems would be significantly reduced.** […] **Food processors**, food service operators and retailers **shape the market and influence consumers' dietary choices through the types and nutritional composition of the food they produce**, their choice of suppliers, production methods and packaging, transport,

merchandising and marketing practices. […] **Moving to a more plant-based diet** with less red and processed meat and with more fruits and vegetables **will reduce** not only risks of life threatening diseases, but also **the environmental impact of the food system**." (EU, Farm to Fork Strategy (2020))

- "**A large body of work has emerged on the environmental impacts of various diets, with most studies concluding that a diet rich in plant-based foods and with fewer animal source foods confers both improved health and environmental benefits**. […] Global consumption of fruits, vegetables, nuts and legumes will have to double, and consumption of foods such as red meat and sugar will have to be reduced by more than 50%. A diet rich in plant-based foods and with fewer animal source foods confers both improved health and environmental benefits. […] The analysis shows that staying within the safe operating space for food systems requires a combination of substantial shifts toward mostly plant-based dietary patterns, dramatic reductions in food losses and waste, and major improvements in food production practices." (*Food in the Anthropocene: the EAT–Lancet Commission on healthy diets from sustainable food systems*, 2019)
- "**Above all, diets heavy in animal products in industrialized countries and the growing middle classes in emerging economies and developing countries are exacerbating land-related problems for climate and biodiversity protection and making sustainable food security more difficult. Promising potential for alleviating this problem lies in changing dietary habits.** In Europe, a corresponding shift in values towards lower levels of meat consumption is already evident. In the WBGU's view, there is an urgent need for a transformation of the global food system and of world-wide dietary habits. Both must be geared equally to human health and the conservation of ecosystem services. In particular, it is essential to encourage changes in consumer behaviour towards a reduced consumption of animal products." (*WBGU – German Advisory Council on Global Change (2021): Rethinking Land in the Anthropocene: from Separation to Integration.* Berlin: WBGU.*)*
- "Land for animal products has dominated land use change (65%) over the past 50 years. […] **This suggests that future dietary changes will become the principal driver for land use change, pointing to the potential need for demand-side measures to regulate agricultural expansion.**" (Alexander et al*, Drivers for global agricultural land use change: The nexus of diet, population, yield and bioenergy* (2015)*)*
- "The paper introduces three 'levers' for reducing pressures on land and creating a more sustainable food system. **The first is to change dietary patterns to reduce food**

demand and encourage more plant-based diets. The second is to protect and set aside land for nature, whether through re-establishing native ecosystems on spared farmland or integrating pockets of natural habitat into farmland. The third is to shift to more sustainable farming. All three levers will be needed for food system redesign to succeed." (Tim Benton et al, *Food System Impact on Biodiversity Loss,* Chatham House (2021))

- **"**Biodiversity is being degraded and lost to a considerable extent, with 70 % of the world's deforestation a result of stripping in order to grow animal feed. **Shifting diets to reduce high levels of meat consumption in developed and transition countries is a key leverage point for tackling biodiversity loss** and climate change, e.g. globally about 30 % of current biodiversity loss and 14.5 % of greenhouse gases are due to animal husbandry". (*Reducing meat consumption in developed and transition countries to counter climate change and biodiversity loss: a review of influence factors*, 2017, https://link.springer.com/article/10.1007/s10113-016-1057-5)
- "As a result, reducing consumption of animal-based foods among the world's wealthier populations could free up significant amounts of land—possibly enabling the world to feed 10 billion people by 2050 without agriculture further expanding into forests." (World Resources Institute)



A. Selection of ingredients for which primary production practices improve biodiversity.

In addition to the general rationale above:

- "If European diets were in line with dietary recommendations, the environmental footprint of food systems would be significantly reduced. […] **Food processors**, food service operators and retailers shape the market and influence consumers' dietary choices through the types and nutritional composition of the food they produce, **their choice of suppliers, production methods** and packaging, transport, merchandising and marketing practices." (EU, Farm to Fork Strategy (2020))
- "[…] the direct pressures (production layer 1) from the Dutch food sector itself were very small, compared to the supply-chain-related losses caused by all suppliers within the chain (Fig. 3a). **The direct suppliers in the food sector (at production layer 2) were found to be responsible for 53% of the biodiversity losses caused by this sector.** Pressures further upstream in the chain caused the remaining 45%." (Quantifying biodiversity footprints of Dutch economic sectors: A global supply-chain analysis, Harry C. Wilting, Mark M.P. van Oorschot, 2017)

B. Selection of protein-rich agricultural ingredients that reduce pressure on biodiversity.

- The focus on selection of protein-rich ingredients being assessed on land use as key driver of biodiversity loss is explained in detail below. Idea is to improve biodiversity substantially by reducing the negative impact on biodiversity of some common protein-rich ingredients, while ensuring a high level of proteins (i.e. nutritional value) is still provided in the final food/beverage product.

- The first bullet (**'inclusion'**) aims to capture the use of protein-rich ingredients with low negative impact on biodiversity as measured through land use. Two options to comply are given, in line with the innovation principle (outcomes-oriented), and enabling frontrunners or best-in-class activities to comply regardless of the type of ingredient:

- **Either** the ingredient is mentioned in the provided positive list of protein-rich ingredients for which the land-use value is below the median value across protein-rich ingredients (see Science study by Poore, J., & Nemecek, T. (2018): *Reducing food's environmental impacts through producers and consumers*.) (see Annex 1)
- **Or** evidence shows that the ingredient's combined direct and indirect land use is on average below 10m2 per 100g of product protein, as calculated by the given calculation method (Annex 1). Note that while on average certain types of ingredients would have lower land use than others, within the same ingredient values can differ widely (e.g. 10^{th} pctl & 90^{th} pctl for Poultry: 3.8 & 9.2; for Pig meat: 4.8 & 19; for Peas: 1.2 & 6.4; for Cheese: 4.3 & 108; for Tofu: 1.1 & 3.1; etc.). This option provides the possibility for best-in-class activities to still comply (e.g. cheese). (See further down for additional data)

- The second bullet (**'limitation'**) aims to limit the use of protein-rich ingredients with high negative impact on biodiversity as measured through land use, to ensure substitution by low negative impact ingredients takes place, rather than them just being added.

- Protein-rich defined as 'Source of protein' (I.e. at least 12% of the energy value of the food is provided by protein) as determined in EU Regulation (EC) No 1924/2006.

- For this option **"**C10.2 Processing and preserving of fish, crustaceans and molluscs" is excluded from the scope, as the measurement of the key driver of biodiversity loss (land use) would need additional criteria to ensure substantial contribution in the context of fishing and aquaculture.

- **Focus on protein-rich products and milk**:

- **The impacts of the lowest-impact animal products exceed average impacts of substitute vegetable proteins across GHG emissions, eutrophication, acidification (excluding nuts), and frequently land use. These stark differences are not apparent in any product groups except protein-rich products and milk**. (J. Poore, T. Nemecek, Science, *Reducing food's environmental impacts through producers and consumers* (2018))
- A key area of EU research will be "**increasing the availability and source of alternative proteins such as plant, microbial, marine and insect-based proteins**

and meat substitutes." (EU Farm to Fork Strategy)

- Focus on land-use:

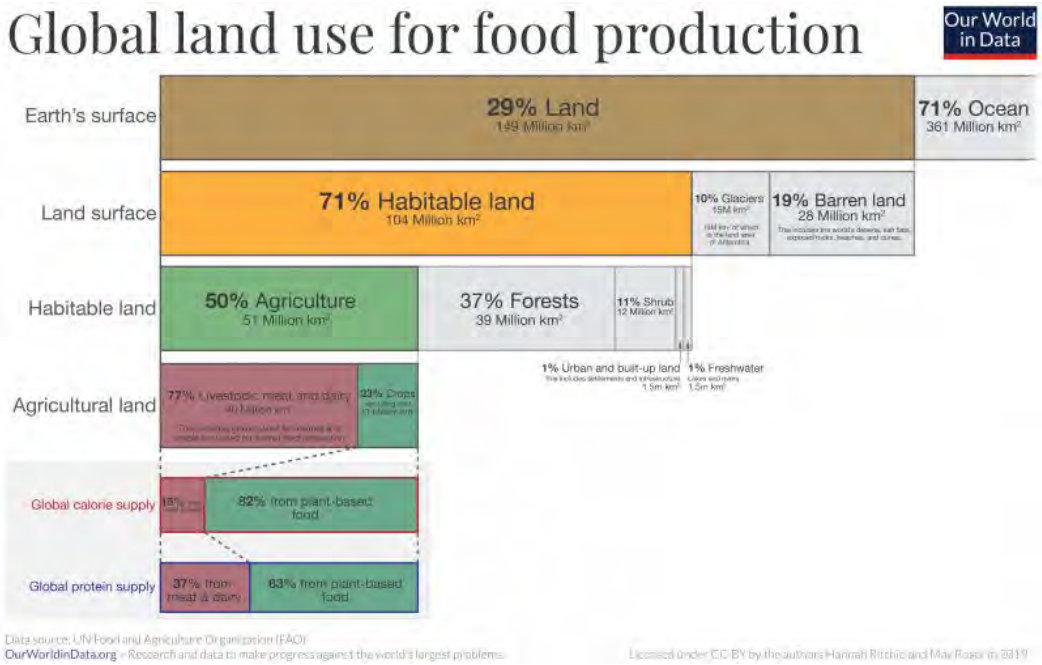
- "Land-use change due to where and how we produce food, is one of the biggest threats humans pose to biodiversity. […] **The most important direct driver of biodiversity loss in terrestrial systems in the last several decades has been land-use change, primarily the conversion of pristine native habitats (forests, grasslands and mangroves) into agricultural systems**." (WWF (2020) *Living Planet Report 2020 - Bending the curve of biodiversity loss.* Almond, R.E.A., Grooten M. and Petersen, T. (Eds). WWF, Gland, Switzerland.)
- "**Habitat loss driven by agricultural expansion is the greatest threat to terrestrial vertebrates**. If current agricultural trends continue, pressures on biodiversity will increase substantially; projections based on population growth and dietary transitions estimate the need for 2–10 million km2 of new agricultural land, largely cleared at the expense of natural habitats" (Williams et al, *Nature Paper: proactive conservation to prevent habitat losses to agricultural expansion* (2021)*)*
- "The **direct drivers of change in nature** with the largest global impact have been (starting with those with most impact): **changes in land and sea use**; direct exploitation of organisms; **climate change**; pollution; and invasion of alien species. […] **Climate change is a direct driver** that is increasingly exacerbating the impact of other drivers on nature and human well-being**."** (*IPBES (2019): Global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*. E. S. Brondizio, J. Settele, S. Díaz, and H. T. Ngo (editors))
- "[…] The direct suppliers in the food sector (at production layer 2) were found to be responsible for 53% of the biodiversity losses caused by this sector. […] **results imply that mitigation of GHG emissions as well as land-use-related options should be considered in sectoral strategies to protect global biodiversity**" (*Quantifying biodiversity footprints of Dutch economic sectors: A global supply-chain analysis,* Harry C. Wilting, Mark M.P. van Oorschot, 2017)
- **"**Agriculture is the largest contributor to biodiversity loss with expanding impacts due to changing consumption patterns and growing populations. **Agriculture destroys biodiversity by converting natural habitats to intensely managed systems and by releasing pollutants, including greenhouses gases.**" (N. Dudley, S. Alexander,

Agriculture and biodiversity: a review, Biodiversity, Volume 18, Issue 2-3: Food, Agriculture and Biodiversity (2017))

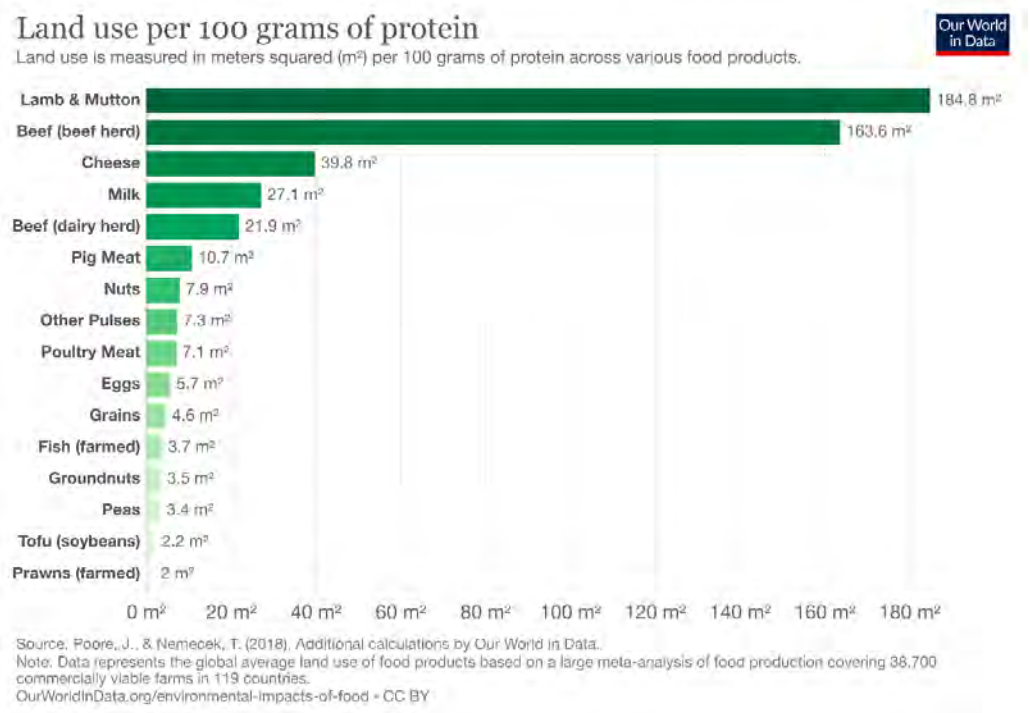
- "This analysis shows that, while agricultural activities are a major source of pollutants and land use change, **livestock production systems dominate the environmental consequences**. The results show that **the livestock sector contributes significantly to agricultural environmental impacts. This contribution is 78% for terrestrial biodiversity loss**, 80% for soil acidification and air pollution (ammonia and nitrogen oxides emissions), 81% for global warming, and 73% for water pollution (both N and P). […] Expressed in terms of MSA (representing an index of the naturalness of an ecosystem), we estimated that overall agriculture, through arable and grazing and emissions of N and GHG, caused a loss of 34% MSA, i.e., more than half of the overall loss of biodiversity (Alkemade et al 2009). **Of this agriculture related loss, 76% was estimated to be caused by livestock, with most of this through feed production**." (A. Leip, G. Billen, J. Garnier, B. Grizzetti, L. Lassaletta, S. Reis, D. Simpson, M. A Sutton, W. de Vries, F. Weiss, *Impacts of European livestock production: nitrogen, sulphur, phosphorus and greenhouse gas emissions, land-use, water eutrophication and biodiversity,* Environmental Research Letters, Volume 10 (2015))
- **"The consumption of animal-sourced food products by humans is one of the most powerful negative forces affecting the conservation of terrestrial ecosystems and biological diversity. Livestock production is the single largest driver of habitat loss**, and both livestock and feedstock production are increasing in developing tropical countries where the majority of biological diversity resides. […] The projected land base required by 2050 to support livestock production in several megadiverse countries exceeds 30–50% of their current agricultural areas. **Livestock production is also a leading cause of climate change, soil loss, water and nutrient pollution, and decreases of apex predators and wild herbivores, compounding pressures on ecosystems and biodiversity.** It is possible to greatly reduce the impacts of animal product consumption by humans on natural ecosystems and biodiversity while meeting nutritional needs of people, including the projected 2–3 billion people to be added to human population." (*Biodiversity conservation: The key is reducing meat consumption*, 2015, https://www.sciencedirect.com/science/article/abs/pii/S0048969715303697)
- **"It shows that EU consumption of livestock products (mainly meat) was the most important driver of deforestation in that period [1990-2008].** […] Hence, **the principal contribution to deforestation embodied in EU27 utilization of agricultural products over the period 1990-2008 is the consumption of livestock**

products (59%), either through the import of feed products or directly through the import of livestock products (mainly meat).**"** (*The impact of EU consumption on deforestation: Comprehensive analysis of the impact of EU consumption on deforestation*, EU, 2013, https://ec.europa.eu/environment/forests/pdf/1.%20Report%20analysis%20of%20impact.pdf)

- **"While livestock takes up most of the world's agricultural land it only produces 18% of the world's calories and 37% of total protein**." (Poore, J., & Nemecek, T. (2018). *Reducing food's environmental impacts through producers and consumers*. Science)



- "Numerous companies are developing plant-based meat analogues. **Based on comparative assessments of the lifecycles of plant-based and beef burgers, plant-based burger production generates 90% less GHG emissions, needs 46% less energy and 99% less water, and has 93% less impact on land use**." *(*Dasgupta, P. (2021), *The Economics of Biodiversity: The Dasgupta Review*. (London: HM Treasury)*)*
- Sources: https://ourworldindata.org/environmental-impacts-of-food



- **Source:** Data published by, Poore, J., & Nemecek, T. (2018). *Reducing food's environmental impacts through producers and consumers*. Science, 360(6392), 987-992. Link, https://science.sciencemag.org/content/360/6392/987)

Data is based on the largest meta-analysis of food system impact studies to date, from Poore & Nemecek's 2018 study. The authors note the following about the scope of the studies included in this meta-analysis: "*We derived data from a comprehensive meta-analysis, identifying 1530 studies for potential inclusion, which were supplemented with additional data received from 139 authors. Studies were assessed against 11 criteria designed to standardize methodology, resulting in 570 suitable studies with a median reference year of 2010. The data set covers ~38,700 commercially viable farms in 119 countries and 40 products representing ~90% of global protein and calorie consumption*'.

Environmental impacts are compared across several metrics: land use (m2), greenhouse gas emissions (tonnes of CO2-equivalents), eutrophying emissions (grams of PO4-equivalents), freshwater withdrawals (liters), and scarcity-weighted water (liters) which are freshwater withdrawals weighted for local water scarcity. All comparisons here are based on the global mean value per food product across all studies. Comparisons can be made in functional units: here all comparisons are made as impacts per kilogram of product. Comparisons are also made on the basis of

nutritional units in two categories: per 100 grams of protein and per 1000 kilocalories. Poore & Nemecek (2018) quantified a range of footprints in nutritional units:

- protein products, which are compared per 100 grams of protein. Protein products include all meats, seafood, dairy, nuts, tofu and pulses. Grains are also compared here – despite being a low-quality source of protein – since a large share of global protein is derived from cereals.
- grains and staples, which are compared per 1000 kilocalories.

Poore & Nemecek (2018) do not provide data per 100g protein for food products which are not protein-rich, or kilocalorie measures for non-stale crops. To provide footprints for all products Our World in Data have filled these gaps by calculating footprints per nutritional unit using food composition factors from the FAO INFOODS International Database and Food Balance Sheets: http://www.fao.org/3/X9892E/X9892e05.htm#P8217_125315 http://www.fao.org/infoods/infoods/tables-and-databases/international-databases/en/

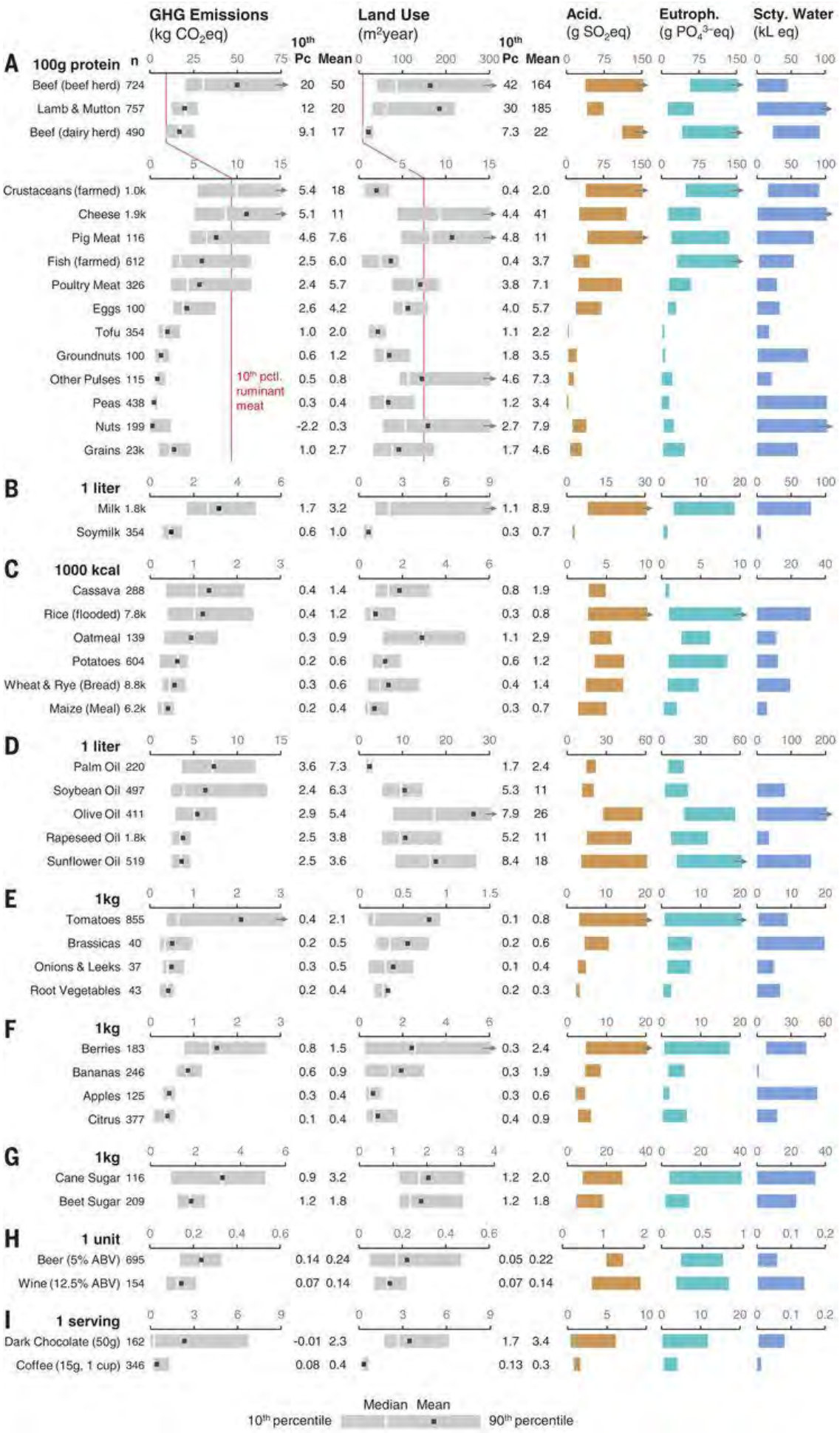
Footprints expressed per kilogram of food product can be converted to per unit protein or kilocalorie using data on the nutrient density of food products. Where nutritional footprints are available from Poore & Nemecek (2018), this data has been used. Where there were gaps, this data has been calculated by Our World in Data.

- Overview average land use per 100g protein (m^2).

Ingredient	Average land use per 100g protein (m^2)
Lamb & Mutton	184.8
Beef (beef herd)	163.6
Cheese	39.8
Milk	27.1
Beef (dairy herd)	21.9
Pig Meat	10.7

Nuts	7.9
Other Pulses	7.3
Poultry Meat	7.1
Oatmeal	5.8
Eggs	5.7
Grains	4.6
Rice	3.9
Groundnuts	3.5
Peas	3.4
Root Vegetables	3.3
Wheat & Rye	3.2
Maize	3.1
Tofu (soybeans)	2.2

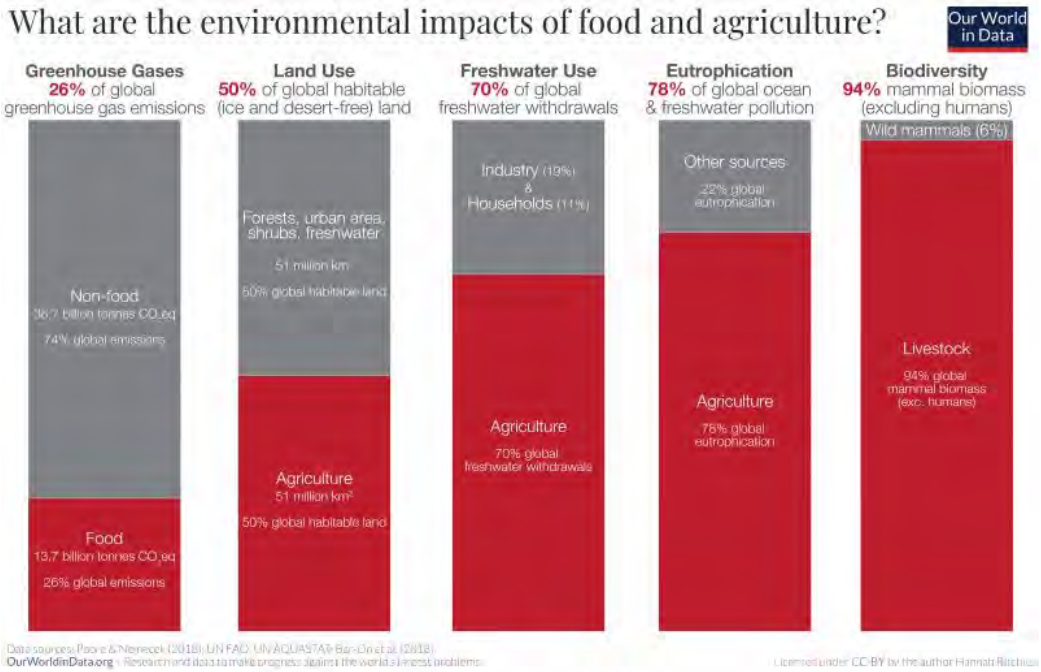
- Overview environmental impact across ingredients.


GHG Emissions (kg CO_2eq)
Land Use (m^2year)
Acid. (g SO_2eq)
Eutroph. (g PO_4^{3-}eq)
Scty. Water (kL eq)
10th Pc
Mean
A 100g protein
n
Beef (beef herd) 724 20 50 42 164
Lamb & Mutton 757 12 20 30 185
Beef (dairy herd) 490 9.1 17 7.3 22
Crustaceans (farmed) 1.0k 5.4 18 0.4 2.0
Cheese 1.9k 5.1 11 4.4 41
Pig Meat 116 4.6 7.6 4.8 11
Fish (farmed) 612 2.5 6.0 0.4 3.7
Poultry Meat 326 2.4 5.7 3.8 7.1
Eggs 100 2.6 4.2 4.0 5.7
Tofu 354 1.0 2.0 1.1 2.2
Groundnuts 100 0.6 1.2 1.8 3.5
Other Pulses 115 0.5 0.8 4.6 7.3
Peas 438 0.3 0.4 1.2 3.4
Nuts 199 -2.2 0.3 2.7 7.9
Grains 23k 1.0 2.7 1.7 4.6
10th pctl. ruminant meat
B 1 liter
Milk 1.8k 1.7 3.2 1.1 8.9
Soymilk 354 0.6 1.0 0.3 0.7
C 1000 kcal
Cassava 288 0.4 1.4 0.8 1.9
Rice (flooded) 7.8k 0.4 1.2 0.3 0.8
Oatmeal 139 0.3 0.9 1.1 2.9
Potatoes 604 0.2 0.6 0.6 1.2
Wheat & Rye (Bread) 8.8k 0.3 0.6 0.4 1.4
Maize (Meal) 6.2k 0.2 0.4 0.3 0.7
D 1 liter
Palm Oil 220 3.6 7.3 1.7 2.4
Soybean Oil 497 2.4 6.3 5.3 11
Olive Oil 411 2.9 5.4 7.9 26
Rapeseed Oil 1.8k 2.5 3.8 5.2 11
Sunflower Oil 519 2.5 3.6 8.4 18
E 1kg
Tomatoes 855 0.4 2.1 0.1 0.8
Brassicas 40 0.2 0.5 0.2 0.6
Onions & Leeks 37 0.3 0.5 0.1 0.4
Root Vegetables 43 0.2 0.4 0.2 0.3
F 1kg
Berries 183 0.8 1.5 0.3 2.4
Bananas 246 0.6 0.9 0.3 1.9
Apples 125 0.3 0.4 0.3 0.6
Citrus 377 0.1 0.4 0.4 0.9
G 1kg
Cane Sugar 116 0.9 3.2 1.2 2.0
Beet Sugar 209 1.2 1.8 1.2 1.8
H 1 unit
Beer (5% ABV) 695 0.14 0.24 0.05 0.22
Wine (12.5% ABV) 154 0.07 0.14 0.07 0.14
I 1 serving
Dark Chocolate (50g) 162 -0.01 2.3 1.7 3.4
Coffee (15g, 1 cup) 346 0.08 0.4 0.13 0.3
Median Mean
10th percentile
90th percentile

C. Selection of ingredients that contribute to critical, endangered, or vulnerable species erosion (i.e. facilitating genetic diversity).

- About 17 % of the world‘s 8,700 animal breeds (from 38 domesticated mammal and bird species) are classified as being at risk of extinction and 58% are of unknown risk status. Farming of rare breeds makes a substantial contribution to B&E by promoting domestic animal genetic resources diversity and/or safeguarding threatened domestic biodiversity (e.g. when farming listed critical, endangered, and vulnerable species and strains) and in many cases also contributes to wild biodiversity through grazing.
- Only stable cross-breeding programmes that involve the maintenance of pure-bred herds or flocks of local breeds are considered. Cross-breeding is tolerated If it does not extend of genetic dilution caused by indiscriminate cross-breeding (indiscriminate cross-breeding refers to a spectrum of actions ranging from upgrading or cross-breeding to complete replacement of a local breed with imported animal genetic resources in an unplanned manner and without adequate assessment of the performance of the respective breeds under relevant production conditions)
- The reliance of the global food production system on a limited number genetically uniform, high-yielding varieties of plants and animals is problematic for both the conservation of biodiversity and for human health. With the loss of diverse sources of food, our food security, Humanity is less resilient and able to cope with change, including climate change. Human health also suffers. The loss of diverse diets is directly linked to malnutrition and noncommunicable diseases such as diabetes, obesity and has a direct impact on the availability of healthy foods and traditional medicines. https://www.cbd.int/idb/image/2019/messages/idb-2019-press-slowfood.pdf
- The world’s livestock production is based on about 40 animal species, with only a handful providing the vast majority of global output of meat, milk and eggs. As of 2018, 7 745 out of 8 803 reported livestock breeds are classed as local (i.e. reported to occur in one country only); 594 of these breeds are extinct. Among extant local breeds, 26 percent are classed as being at risk of extinction, 7 percent as not at risk and 67 percent as being of unknown risk status. http://www.fao.org/3/CA3129EN/CA3129EN.pdf#page=158
- **“94% of mammal biomass (excluding humans) is livestock. This means livestock outweigh wild mammals by a factor of 15-to-1"** (Bar-On, Y. M., Phillips, R., & Milo, R. (2018). *The biomass distribution on Earth*. Proceedings of the National Academy of Sciences). Of the 28,000 species evaluated to be threatened with

extinction on the IUCN Red List, agriculture and aquaculture is listed as a threat for 24,000 of them.

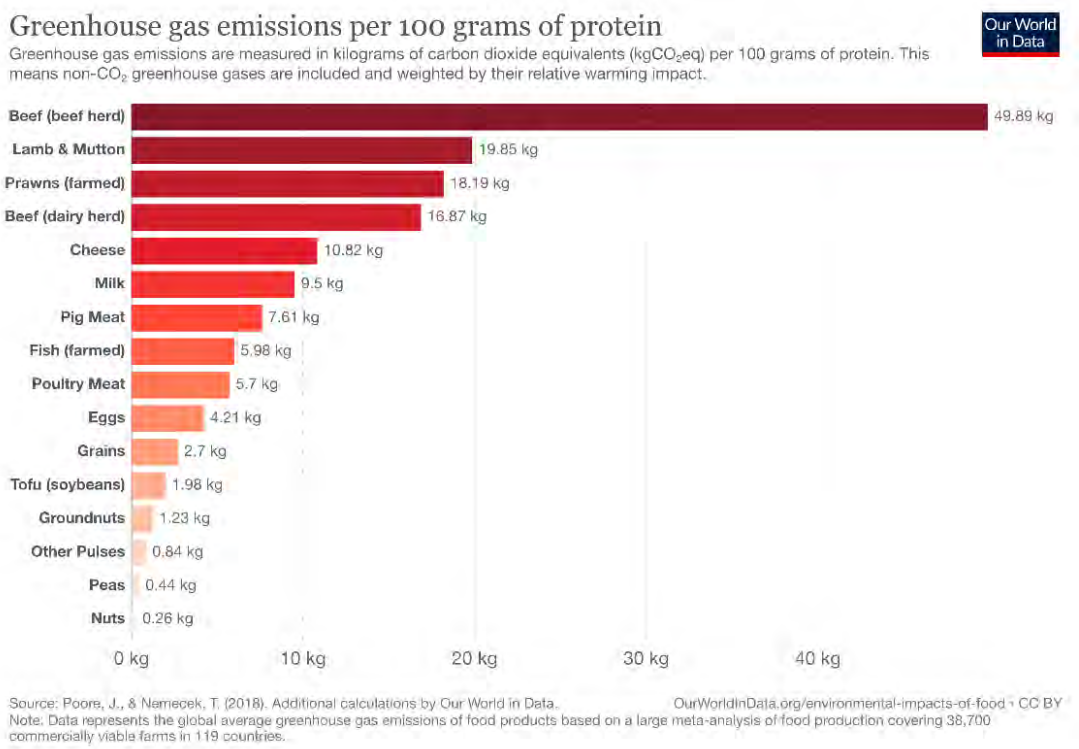


For this option **"**C10.2 Processing and preserving of fish, crustaceans and molluscs" is excluded from the scope, as the argumentation is built on crops and livestock on land. Hence, the rationale and criteria would need to be expanded to ensure substantial contribution in the context of fishing and aquaculture

DNSH RATIONALE

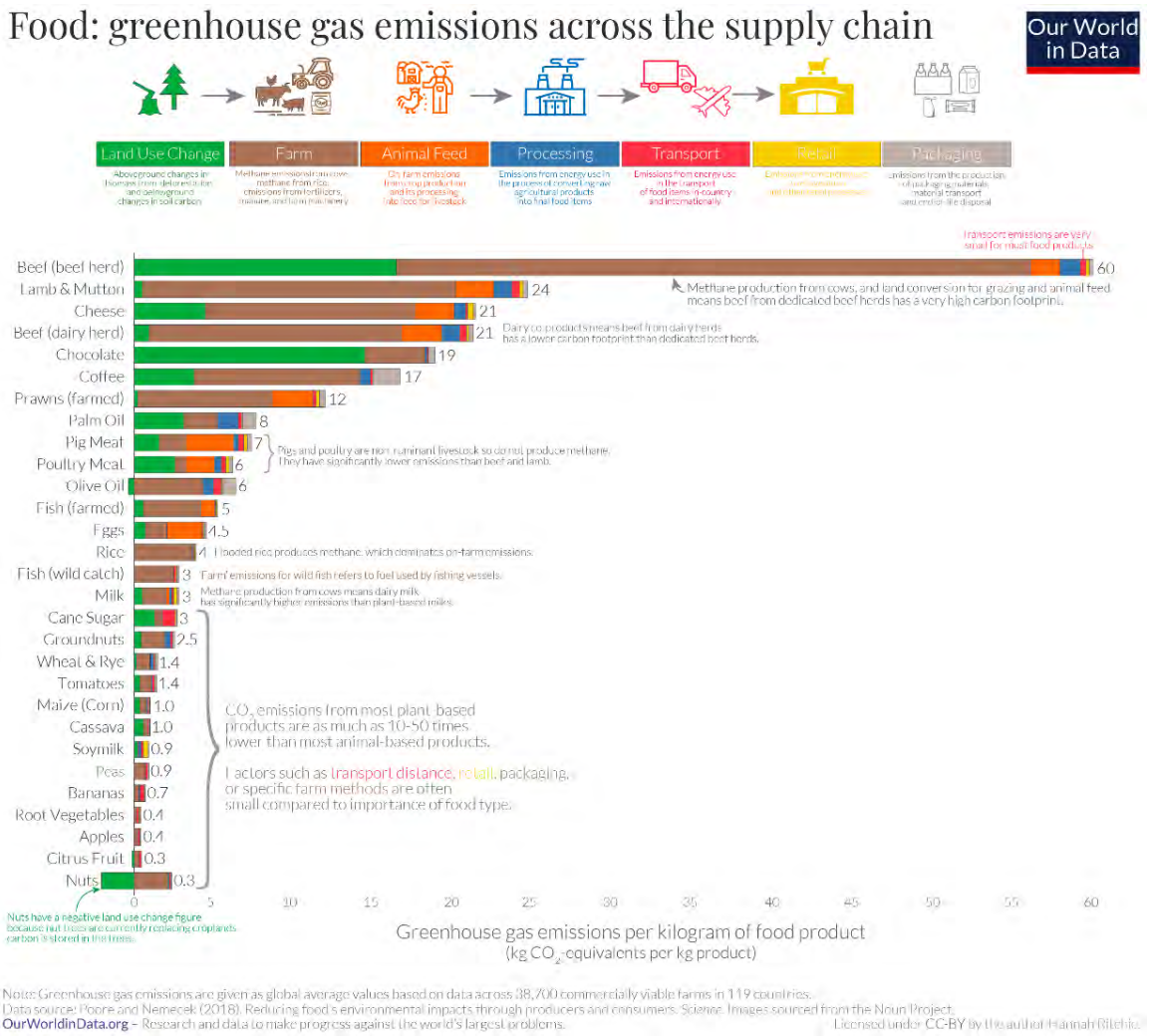
CCM

- GHG emissions are included to avoid unintended consequence of optimising for only one variable (land use) and thus incentivising practices that would be significantly harmful to climate change mitigation efforts (e.g. certain highly intensive production methods)



- In addition, high GHG emissions could mitigate the biodiversity improvement gained through limiting land use:
    - "Globally, **climate change** has not been the most important driver of the loss of biodiversity to date, yet in coming decades it **is projected to become as, or more, important than the other drivers. Climate change adversely affects genetic variability, species richness and populations, and ecosystems**" (WWF (2020) *Living Planet Report 2020 - Bending the curve of biodiversity loss.* Almond, R.E.A., Grooten M. and Petersen, T. (Eds). WWF, Gland, Switzerland.)
    - "It is predicted that climate change could overtake land-use change as the leading cause of biodiversity loss by 2070 (Newbold, 2018). […] Therefore, **mitigating against the worst effects of climate change will have significant benefits for biodiversity** […] Climate change is already harming biodiversity in many ways. […] Climate change is already contributing to rapid, broad-scale ecosystem changes, with significant consequences for biodiversity. (Dasgupta, P., *The Economics of Biodiversity: The Dasgupta Review*. (2021) (London: HM Treasury))
- Ingredients have varying impact on GHG emissions across the supply chain (see chart below). In order to create transparency across the supply chain, we require

transparency, which can be a start for further improvement across the supply chain, without requiring meeting certain threshold here.



Circular economy

- Food losses and waste are responsible for significant resource and environmental pressures, with an estimated 20% of the total food produced being lost or wasted in the EU (*CEAP 2020*), of which around one fifth is generated at the food processing step.[16]

- Reduction of food/beverage loss and waste is supported by setting a reduction target, measuring food loss and waste to identify hot spots and to monitor progress, and acting boldly to reduce food. The Commission is committed to halving per capita food waste at retail and consumer levels by 2030 (SDG Target 12.3) (*EU Farm to Fork Strategy*).

- A coalition of nearly 200 major food suppliers, manufacturers and retailers (including Ahold Delhaize, Walmart, Kroger, Mondelez, Nestlé, and PepsiCo) committed to the 10x20x30 initiative, with the goal cutting their food waste in half by 2030.[17]

- This criterion helps achieve TR Art 13.1.(a) (i.e. *use natural resources, including sustainably sourced bio-based and other raw materials, in production more efficiently, including by: (i) reducing the use of primary raw materials or increasing the use of by-products and secondary raw materials; or (ii) resource and energy efficiency measures*).
- This criterion helps prevent or reduce waste generation, TR Art 13.1.(g).

2.19 Manufacture of food products and beverages (making a substantial contribution to the transition to a circular economy)

Description of the activity

Manufacture of food products. The activity is classified under NACE code C10 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

Manufacture of Beverages. The activity is classified under NACE code C11 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

Substantial contribution to transition to a circular economy

SUMMARY: An economic activity shall qualify as contributing substantially to the transition to a circular economy, including waste prevention, re-use and recycling, where that economic activity complies with one of the following criteria:

A. The primary food/beverage packaging is kept in the economy through reuse, and food/beverage loss & waste is minimised. The activity complies with:

- A.1. Design for reuse in practice
- A.2. Design for recycling in practice
- A.3. Food/beverage loss & waste reduction

B. The primary, secondary and tertiary food/beverage packaging material feedstock

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choice and packaging design support recycling, and food/beverage loss & waste is minimised. The activity complies with:

- B.1. Use of recycled or renewable feedstock
- B.2. Design for recycling in practice
- B.3. Food/beverage loss & waste reduction

An economic activity shall qualify as contributing substantially to the transition to a circular economy, including waste prevention, re-use and recycling, where that economic activity complies with one of the following criteria:

A. The primary food/beverage packaging is kept in the economy through reuse in practice and food/beverage loss & waste is minimised. The activity complies with the following criteria:

A.1. Design for reuse in practice: The primary packaging of the manufactured food/beverage products has been designed to accomplish, or proves its ability to accomplish on average a minimum of 10 trips or rotations in a system for reuse, where:

- A trip is defined as transfer of packaging, from filling/loading to emptying/unloading, and a rotation is defined as a cycle undergone by reusable packaging from filling/loading to filling/loading.
- The minimum number of trips or rotations refers to the fact that the 'system for reuse' in place should be proven to work in practice.
- A system for reuse is defined as established arrangements (organisational, technical or financial) which ensure the possibility of reuse, in closed-loop, open-loop or in a hybrid system.

- Reuse of packaging is an operation by which packaging is refilled or used for the same purpose for which it was conceived, with or without the support of auxiliary products present on the market, enabling the packaging to be refilled.[309]

If the system for reuse for which the packaging is being developed is not yet in place, evidence is needed on how on average a minimum of 10 trips or rotations is expected in the future system for reuse (e.g. based on comparison to an existing system with similar characteristics).

A.2. Design for recycling in practice: The primary packaging of the manufactured food/beverage products is designed to be recyclable; or, in the case of high likelihood of the packaging being nutrient-contaminated, home-compostable; or a combination of these, to take place when the packaging can no longer be reused, based on the following definitions:

- **Recyclable packaging:** A package is recyclable if its main packaging components, together representing at least 95% of the entire packaging weight, are recyclable, and if the remaining minor components are compatible with the recycling process and do not hinder the recyclability of the main components, where:
    - A packaging component is a part of packaging that can be separated by hand or by using simple physical means, e.g. a cap, a lid and (non in-mould) labels.
    - A packaging constituent is a part from which packaging or its components are made and which cannot be separated by hand or by using simple physical means (e.g. a layer of a multi-layered pack or an in-mould label).
    - A packaging component can only be considered recyclable if for that entire component, excluding minor incidental constituents, successful post-consumer collection, sorting, and recycling is proven to work in practice and at scale. If just one material of a multi-material component is recyclable, one can only claim recyclability of that material, not of the component as a whole.
    - Post-consumer material is defined as material generated by households or by commercial, industrial and institutional facilities in their role as end users of the product which can no longer be used for its intended purpose. This includes returns of material from the distribution chain. It excludes pre-consumer material (e.g. production scrap).

[309] An example of an auxiliary product is a detergent pouch used to refill a reusable container at home. Auxiliary products that are one-way products (i.e. designed to be used once) are not considered reusable packaging.

- Successful post-consumer collection, sorting, and recycling works ‘in practice and at scale’ if the packaging achieves a minimum post-consumer recycling rate:
  - Either in the jurisdiction where the packaging is put on the market, regardless of the jurisdiction’s size;
  - Or in multiple regions that collectively represent at least 200 million inhabitants;

  of at least the minimum 2025 targets set by the Directive (EU) 2018/852 (by material, by weight): 50% of plastic; 25% of wood; 70% of ferrous metals; 50% of aluminium; 70% of glass; 75% of paper and cardboard.

- Packaging for which the only proven way of recycling is recycling into applications that do not allow any further use-cycles for the same or a similar application (e.g. plastics-to-roads, packaging-to-textiles) cannot be considered ‘recyclable packaging’.

- **Home-compostable packaging:** A packaging or packaging component is home-compostable if it is certified with relevant internationally recognised home-compostability certification schemes, or complying with internationally recognised home-compostability testing norms, where:
  - A packaging component is a part of packaging that can be separated by hand or by using simple physical means (e.g. a cap, a lid and (non in-mould) labels).
  - Approved home-compostability certification schemes: TÜV AUSTRIA Belgium (OK Compost Home), DIN CERTCO (DIN-Geprüft Home compostable), AfOR (FILM home compostable), and ABA (Home compostable).
  - Approved standards for testing: NF T 51-800, AS 5810.
  - The packaging is put on the market in regions where the necessary systems are in place to ensure collection and organic recycling in practice, or where it is proven that a significant share of the population is home-composting.

A.3. Food/beverage loss & waste reduction: The economic activity is driving a reduction of food/beverage loss and waste by compliance with all of the following criteria:

- **2030 reduction targets for food/beverage loss & waste at the processing step are set and made public**, such as via the company website, with a reduction target of at least 50% compared to a 2016 baseline, or more recent if not applicable.
- **At least 3 of the following criteria are implemented:**
    - Monitoring, measuring and reporting on food/drink loss and waste quantities through an environmental management system in order to identify and take action on hotspots.
    - Integration of food/beverage loss & waste prevention considerations and targets throughout the business/supply chain, including into planning/forecasting of raw material buying.
    - Development of sales of co-products and/or creation products that utilise such co-products by transforming them into new ingredients, food, feed or fertiliser.
    - Improvement of date marking practices and consumer understanding of date marking and other relevant food information.
    - Provision of on-label and/or online information to consumers about better food by products management.
    - Where food surpluses cannot be avoided, prioritisation of edible food redistribution to humans before facilitating safe food to feed transition.

B. The primary, secondary and tertiary food/beverage packaging material feedstock choice and design supports recycling, and food loss & waste is minimised. The activity complies with the following criteria:

B.1. Use of recycled or renewable feedstock: For the primary, secondary and tertiary food/beverage packaging of the manufactured food/beverage products, at least 85% of the total packaging by weight consists of material that is complying with one of the following criteria:

- Fully manufactured by mechanical or chemical recycling of post-consumer material, with claims on recycled content made using a batch level mass balance method. For chemical recycling technologies the material conversion rate should be at least the rate of existing mechanical recycling technologies for that material.

- Derived from renewable feedstock, which is material that is composed of biomass from a living source and that can be continually replenished, or from a source which is continually replenished by nature. When claims of renewability are made for virgin materials, evidence is provided to show that those materials shall come from sources that are replenished at a rate equal to or greater than the rate of depletion.
- A combination of the options above.

Claims on the recycled and/or renewable content should be provided in line with internationally recognised certification systems, such as ISCC PLUS certified packaging.

B.2. Design for recycling in practice: The primary, secondary and tertiary packaging of the manufactured food/beverage products is designed to be recyclable; or, in the case of high likelihood of the packaging being nutrient-contaminated, home-compostable; or a combination of these, based on the following definitions:

- **Recyclable packaging:** A package is recyclable if its main packaging components, together representing at least 95% of the entire packaging weight, are recyclable, and if the remaining minor components are compatible with the recycling process and do not hinder the recyclability of the main components, where:
    - A packaging component is a part of packaging that can be separated by hand or by using simple physical means, e.g. a cap, a lid and (non in-mould) labels.
    - A packaging constituent is a part from which packaging or its components are made and which cannot be separated by hand or by using simple physical means (e.g. a layer of a multi-layered pack or an in-mould label).
    - A packaging component can only be considered recyclable if for that entire component, excluding minor incidental constituents, successful post-consumer collection, sorting, and recycling is proven to work in practice and at scale. If just one material of a multi-material component is recyclable, one can only claim recyclability of that material, not of the component as a whole.
    - Post-consumer material is defined as material generated by households or by commercial, industrial and institutional facilities in their role as end users of the product which can no longer be used for its intended purpose. This includes returns of material from the distribution chain. It excludes pre-consumer material (e.g. production scrap).

- Successful post-consumer collection, sorting, and recycling works ‘in practice and at scale’ if the packaging achieves a minimum post-consumer recycling rate:
  - Either in the jurisdiction where the packaging is put on the market, regardless of the jurisdiction’s size;
  - Or in multiple regions that collectively represent at least 200 million inhabitants;

  of at least the minimum 2025 targets set by the Directive (EU) 2018/852 (by material, by weight): 50% of plastic; 25% of wood; 70% of ferrous metals; 50% of aluminium; 70% of glass; 75% of paper and cardboard.

- Packaging for which the only proven way of recycling is recycling into applications that do not allow any further use-cycles for the same or a similar application (e.g. plastics-to-roads, packaging-to-textiles) cannot be considered ‘recyclable packaging’.

- **Home-compostable packaging:** A packaging or packaging component is home-compostable if it is certified with relevant internationally recognised home-compostability certification schemes, or complying with internationally recognised home-compostability testing norms, where:
  - A packaging component is a part of packaging that can be separated by hand or by using simple physical means (e.g. a cap, a lid and (non in-mould) labels).
  - Approved home-compostability certification schemes: TÜV AUSTRIA Belgium (OK Compost Home), DIN CERTCO (DIN-Geprüft Home compostable), AfOR (FILM home compostable), and ABA (Home compostable).
  - Approved standards for testing: NF T 51-800, AS 5810.

B.3. Food/beverage loss & waste reduction: The economic activity is driving a reduction of food/beverage loss and waste by compliance with all of the following criteria:

- **2030 reduction targets for food/beverage loss & waste at the processing step are set and made public**, such as via the company website, with a reduction target of at least 50% compared to a 2016 baseline, or more recent if not applicable.
- **At least 3 of the following criteria are implemented:**

	o Monitoring, measuring and reporting on food/drink loss and waste quantities through an environmental management system in order to identify and take action on hotspots. o Integration of food/beverage loss & waste prevention considerations and targets throughout the business/supply chain, including into planning/forecasting of raw material buying. o Development of sales of co-products and/or creation products that utilise such co-products by transforming them into new ingredients, food, feed or fertiliser. o Improvement of date marking practices and consumer understanding of date marking and other relevant food information. o Provision of on-label and/or online information to consumers about better food by products management. o Where food surpluses cannot be avoided, prioritisation of edible food redistribution to humans before facilitating safe food to feed transition.

Do no significant harm ('DNSH')	
(1) Climate change mitigation	The economic activity complies with the following: • For each of the material(s) used in the primary, secondary and tertiary packaging: Lifecycle GHG emissions, including intended end-of-life treatment, of chemically recycled, biobased and CCU feedstock are lower than the lifecycle GHG emissions of the equivalent material in primary form manufactured from fossil fuel feedstock. Lifecycle GHG emissions are calculated using Commission Recommendation 2013/179/EU or, alternatively, using ISO 14067:2018 or ISO 14064-1:2018. Quantified lifecycle GHG emissions are verified by an independent third party. • If the activity uses on-site generation of heat/cool or co-generation including power, the direct GHG emissions of that activity are lower than 270 gCO2e/kWh. • Transparency on greenhouse gases emitted during the food/beverage manufacturing processes for the final

	food/beverage product, expressed in $kgCO_2eq$ per kilogram of food/beverage product. • Primary production activities that yield the ingredients sourced comply with the following criteria: o (a) permanent grassland is maintained (In accordance with GAEC 1 of Annex II to Regulation (EU) No 1306/2013). o (b) wetland and peatland are appropriately protected (In accordance with GAEC 2 of Annex II to Regulation (EU) No 1306/2013). o (c) arable stubble is not burnt, except where an exemption has been granted for plant health reasons (In accordance with GAEC 3 of Annex II to Regulation (EU) No 1306/2013). o (d) minimum land management under tillage, including on slopes (In accordance with GAEC 6 of Annex II to Regulation (EU) No 1306/2013). o (e) activity does not involve the degradation of land with high carbon stock - Continuously forested areas, namely land spanning more than one hectare with trees higher than five meter and a canopy cover of between 10 and 30% or able to reach those thresholds in situ (In accordance with Article 29, paragraphs 4 and 5, of Directive (EU) 2018/2001. This requirement applies to all perennial crop production, whether for biofuels, bioliquids or biomass, or for food or feed uses), are not converted. - No use of peat – e.g. as growing medium, fertilizer, animal bedding, etc
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) …/…]

(3) Sustainable use and protection of water and marine resources	• Generic criteria for DNSH to sustainable use and protection for water and marine resources as laid out in Appendix B to Annex I on Climate Change Mitigation.[310] • The waste water discharge from the food processing stage must be within the BAT defined per unit parameters, where applicable, or follow the BAT recommended techniques, methods and equipment for the use of water, for activities where per unit parameters are not defined.
(5) Pollution prevention and control	• Generic criteria for DNSH to pollution prevention and control as laid out in Appendix C to Annex I on Climate Change Mitigation.[311] • Emissions are at least within the emission levels associated with the best available techniques (BAT-AEL) ranges set out in the best available techniques (BAT) conclusions for the production[312]. No significant cross-media effects occur. • For each of the material(s) used in the primary, secondary and tertiary packaging, the following holds: o **If the material is plastic**: Emissions are within or lower than the emission levels associated with the best available techniques (BAT-AEL) ranges set out in the Best Available Techniques Reference Document (BREF) for the Production of Polymers: Reference Document on Best Available Techniques in the Production of Polymers (https://eippcb.jrc.ec.europa.eu/sites/default/files/2019-

[310] As required by Directive 2000/60/EC for activities subject to Union law or as required by equivalent national provisions or international standards addressing environmental degradation risks related to preserving water quality and avoiding water stress for activities in third countries. Where an Environmental Impact Assessment is carried out in accordance with Directive 2011/92/EU and includes an assessment of the impact on water in accordance with Directive 2000/60/EC, no additional assessment of impact on water is required, provided the risks identified have been addressed.

[311] Industrial Emissions Directive 2010/75/EU (Integrated Pollution Prevention and Control)

[312] Industrial Emissions Directive 2010/75/EU (Integrated Pollution Prevention and Control)

	11/pol_bref_0807.pdf). No significant cross-media effects occur. o **If the material is metal:** Emissions are within or lower than the emission levels associated with the best available techniques (BAT-AEL) ranges set out in the Best Available Techniques Reference Document (BREF) for the non-ferrous metals industries: Industrial Emissions Directive 2010/75/EU (Integrated Pollution Prevention and Control) (https://eippcb.jrc.ec.europa.eu/reference/non-ferrous-metals-industries-0). No significant cross-media effects occur. o **If the material is glass:** Emissions are within or lower than the emission levels associated with the best available techniques (BAT-AEL) ranges set out in the Best Available Techniques Reference Document (BREF) for the Manufacture of Glass: Industrial Emissions Directive 2010/75/EU (Integrated Pollution Prevention and Control) (https://eippcb.jrc.ec.europa.eu/reference/manufacture-glass-0). No significant cross-media effects occur. o **If the material is paper or cardboard:** Emissions are within or lower than the emission levels associated with the best available techniques (BAT-AEL) ranges set out in the Best Available Techniques Reference Document (BREF) for the Production of Pulp, Paper and Board: Industrial Emissions Directive 2010/75/EU (Integrated Pollution Prevention and Control) (https://eippcb.jrc.ec.europa.eu/reference/production-pulp-paper-and-board). No significant cross-media effects occur. If there is on-site generation of heat/cool or co-generation with power, then emissions are within or lower than the emission levels associated with the best available techniques (BAT-AEL) ranges set out in the best available techniques (BAT) conclusions for large combustion plants. No significant cross-media effects occur, or for combustion plants greater

	than 1 MW thermal input but below the thresholds for the BAT conclusions for large combustion plants to apply, emissions are below the emission limit values set out in Annex II, part 2, to Directive (EU) 2015/2193
(6) Protection and restoration of biodiversity and ecosystems	Generic criteria for DNSH to protection and restoration of biodiversity and ecosystems as laid out in Appendix D to Annex I on Climate Change Mitigation. For sites/operations located in or near to biodiversity-sensitive areas (including the Natura 2000 network of protected areas, UNESCO World Heritage sites and Key Biodiversity Areas (KBAs), as well as other protected areas), ensure that an appropriate assessment has been conducted in compliance with the provisions of the EU Biodiversity Strategy (COM (2011) 244), the Birds (2009/147/EC) and Habitats (92/43/EEC) Directives or in the case of activities located in non-EU countries, other equivalent national provisions or international standards (e.g. IFC Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources) – based on the conservation objectives of the protected area. Any biomass used for the packaging solutions should comply with the sustainability requirements of the EU regulatory framework i.e. EU Forest Strategy, EU Forest Law Enforcement Governance and Trade (FLEGT), EU Timber Regulation (EUTR 995/2010), LULUCF Regulation (841/2018), as applicable. In particular, any wood raw materials should be sourced from responsible forest management as defined by intergovernmental definition such as forest Europe H1 resolution and embedded and implemented in existing national forest and nature legislation or market based voluntary systems such as, the Forest Stewardship Council (FSC) scheme or PEFC, with additional due diligence for any high-risk sources as defined by the EUTR and guided by the provisions of the Renewable Energy Directive 2.

Rationale

All economic activities covered by these NACE codes are included, as all of them can achieve SC to the circular economy objective by meeting criteria on their packaging and food/beverage loss and waste.

- **Packaging** plays a key role in the sustainability of food/beverage systems and is a focus for achieving circular economy ambitions and policies (see, e.g. *EU Farm to Fork strategy*; *Circular Economy Action Plan 2020*; *Single-Use Plastics Directive*, *A European Strategy for Plastics in A Circular Economy (2018)*), and for its impact on several (non-) renewable material streams (e.g. glass, metal, fossil-based plastics). Packaging activities have the potential to contribute substantially to the circular economy objective:

    - **Packaging-free solutions, reusing packaging, recycling packaging or elimination of unnecessary packaging** can contribute to Art 13.1.(a) (i.e. *uses natural resources, including sustainably sourced bio-based and other raw materials, in production more efficiently, including by: (i) reducing the use of primary raw materials or increasing the use of by-products and secondary raw materials; or (ii) resource and energy efficiency measures)*. The Commission announced to launch analytical work to determine the scope of a legislative initiative on reuse to substitute single-use packaging [tableware and cutlery] by reusable products in food service (*CEAP 2020*).

    - **Packaging design for reusability and/or recyclability (including organic recycling)** can contribute to Art 13.1.(b), i.e. *increases the durability, reparability, upgradability or reusability of products, in particular in designing and manufacturing activities,* and to Art 13.1.(c), i.e. *increases the recyclability of products, […], in particular in designing and manufacturing activities.*

    - **Phasing out hazardous substances in food packaging, e.g. bisphenols,** can contribute to Art 13.1.(d), i.e. *substantially reduces the content of hazardous substances and substitutes substances of very high concern in materials and products throughout their life cycle […].*

    - **Use of recycled content, residues or material sourced through industrial symbiosis in packaging design and manufacturing** can contribute to Art

13.1.(f), i.e. *increases the use of secondary raw materials and their quality, including by high-quality recycling of waste.*

Food loss and waste reduction during the food and beverages manufacturing step can contribute to the circular economy objective: while the food value chain is responsible for significant resource and environmental pressures, an estimated 20% of the total food produced is lost or wasted in the EU (*CEAP 2020*), of which roughly a fifth is generated at the food processing step.[1] Food loss and waste activities have the potential to contribute substantially to the circular economy objective, in particular, to Art 13.1.(a), i.e. *uses natural resources, including sustainably sourced bio-based and other raw materials, in production more efficiently, including by: (i) reducing the use of primary raw materials or increasing the use of by-products and secondary raw materials; or (ii) resource and energy efficiency measures.*

TECHNICAL SCREENING CRITERIA RATIONALE

General

- These two sets of criteria are developed in line with the ambition of the EU CEAP 2020: "*All packaging on the EU market is reusable or recyclable in an economically viable way by 2030*". In addition, it builds on and reinforces the following EU policies and strategy documents: *A European Strategy for Plastics in a Circular Economy* (COM/2018/028)*, Single-Use Plastics Directive* (Directive (EU) 2019/904), Amended Packaging and Packaging Waste Directive (Directive (EU) 2018/852), and *Farm to Fork Strategy* (COM/2020/381).

- Food losses and waste are responsible for significant resource and environmental pressures, with an estimated 20% of the total food produced being lost or wasted in the EU (CEAP 2020), of which around one fifth is generated at the food processing step.

- Definitions are based on the Global Commitment (Ellen MacArthur Foundation & UN Environment Programme)[313], ISO standards (e.g. 14021, 18601), US FT Green Guides and other relevant expert bodies

A. The primary food/beverage packaging is kept in the economy through reuse in practice and food/beverage loss & waste is minimised.

[313] https://www.newplasticseconomy.org/assets/doc/Global-Commitment_Definitions_2020-1.pdf

This set of criteria is developed in line with the ambition of the EU CEAP 2020: "*All packaging on the EU market is reusable or recyclable in an economically viable way by 2030*". The European Parliament has called for an increase in the share of reuse to 10% by 2030.

A.1. Design for reuse in practice

- This criterion helps increase the reusability of products, in particular in designing and manufacturing activities, TR Art 13.1.(b); Focus on design for reuse in a way that packaging will allow for multiple cycles in practice.

- Upstream measures of design can only obtain their full impact with regards to SC if activities downstream are aligned. This means that design for reuse should be complemented with a working reuse system in practice.

- Focus on primary packaging for reuse as most difficult to tackle given B2C nature, involving possible fundamental change of the delivery model (e.g. implement reuse system, move to bulk selling). Often reuse and/or recycling of secondary and tertiary packaging is more straightforward in a B2B setting due to larger volumes of clean material with higher purity (e.g. cardboard boxes, film wrap, wooden pallets). It is estimated that at least 20% of plastic packaging could be replaced by reusable systems (World Economic Forum, Ellen MacArthur Foundation and McKinsey & Company, *The New Plastics Economy — Rethinking the future of plastics,* (2016, http://www.ellenmacarthurfoundation.org/publications)).

- Setting minimum numbers of trips/rotations at 10:

* In general, studies show that a reusable packaging should be used at least 10 to 15 times to have a smaller impact than single-use packaging, and average number of trips for reusable glass bottles is 25-30 trips; (Reloop & University of Utrecht, *Reusable vs Single-Use Packaging: A Review of Environmental Impacts* (2020)).[314]OBJ

* OPRL Refill Labels Offer Consumer Reassurance on Reusable Packaging: 'designed for reuse for its original purpose a minimum of 10 times'.[315]

[314] Reloop & University of Utrecht, *Reusable vs Single-Use Packaging: A Review of Environmental Impacts* (2020), https://www.reloopplatform.org/reusable-vs-single-use-packaging-a-review-of-environmental-impacts/

[315] https://www.oprl.org.uk/wp-content/uploads/2021/04/OPRL-Launches-Refillable-Packaging-Labels.pdf ; https://www.foodservicefootprint.com/new-refill-labels-launched/

* Reusable plastic crates for vegetables and fruits were already environmentally beneficial after reusing the crate three times. (P Megale Coelho, B Corona, R ten Klooster, E Worrell, *Sustainability of reusable packaging – Current situation and trends*, Resources, Conservation & Recycling: X, Elsevier (2020))

* A range of reuse examples, both large corporates and SMEs, can be found here: https://plastics.ellenmacarthurfoundation.org/upstream

A.2. Design for recycling in practice

- When the packaging is no longer fit for another reuse cycle, it will contribute to the circular economy by being recycled, for which the design is crucial to ensure recycling in practice.

- To make that happen, it is important to increase the recyclability of products, including the recyclability of individual materials contained in those products, in particular in designing and manufacturing activities, TR Art 13.1.(c).

- In addition, to achieve its substantial contribution one has to ensure recyclability goes beyond theoretical possibility: a packaging or packaging component is recyclable if its successful post-consumer collection, sorting, and recycling is proven to work in practice and at scale (in CEAP 2020 words: 'recyclable in an economically viable way'). In other words, to achieve substantial contribution food/beverage manufacturers must ensure the link between putting 'recyclable' packaging on the market and the actual collection, sorting and recycling in reality for that type of packaging. To make such a system work, scale is needed, which can either be provided by (just a few very) large corporates, by different companies as whole, i.e. (part of) the industry, or government intervention. As a result one cannot treat a food/beverage manufacturers packaging choice as happening in a vacuum. In line with the systemic nature of the transition to a circular economy, different steps of the value chain are relevant.

- The suggested approach allows companies to claim recycling in practice in small or large regions/jurisdictions for which collection, sorting and recycling works (i.e. achieves minimum recycling rate), or introduce packaging into new regions if the collection, sorting and recycling has been proven to work already at scale in other areas. In particular, to ensure recycling in practice and at scale two options have been developed: there is a minimum recycling rate (by weight):

- either in the jurisdiction where the packaging is put on the market: so even if the collection/sorting/recycling system is a small, low-scale, if there is one, it is likely that the

packaging will be collected and recycled, and thus substantial contribution achieved. The food/beverage manufacturer can decide to choose packaging for its food/beverage product that fits the present system.

- or in multiple regions that collectively represent at least 200 million inhabitants: this option allows companies to put packaging on markets where the right infrastructure is not (yet) in place, but for which it is proven that collection/sorting/recycling works in practice and at scale elsewhere (so in CEAP 2020 words: 'recyclable in an economically viable way'). Idea is that, if the business case makes sense, at some point industry/government would catch up (or will have to anyways). Regardless of the presence of the right infrastructure, the food/beverage manufacturer can decide to choose packaging for which there exists such a working system at scale, even if it is not locally. The packaging choice is up to the manufacturer, and independent from local government/industry.

- Directive (EU) 2018/852 sets targets as follows: By 2025, a minimum of 65 % by weight of all packaging waste will be recycled, and the following minimum targets by weight for recycling will be met: 50 % of plastic; 25 % of wood; 70 % of ferrous metals; 50 % of aluminium; 70 % of glass; 75 % of paper and cardboard.

- The inclusion of home-compostability aims to capture the benefits of organic recycling for targeted applications by helping recover nutrients of packaging contents (e.g. food left-overs), while limiting potential unintended consequences through a strict definition.

A.3. Food/beverage loss & waste reduction

- Food losses and waste are responsible for significant resource and environmental pressures, with an estimated 20% of the total food produced being lost or wasted in the EU (*CEAP 2020*), of which around one fifth is generated at the food processing step.[316]

[316] Recommendations for Action in Food Waste Prevention Developed by the EU Platform on Food Losses and Food Waste (2019) https://ec.europa.eu/food/sites/food/files/safety/docs/fs_eu-actions_action_platform_key-recs_en.pdf

- Reduction of food/beverage loss and waste is supported by setting a reduction target, measuring food loss and waste to identify hot spots and to monitor progress, and acting boldly to reduce food. The Commission is committed to halving per capita food waste at retail and consumer levels by 2030 (SDG Target 12.3) (*EU Farm to Fork Strategy*).

- A coalition of nearly 200 major food suppliers, manufacturers and retailers (including Ahold Delhaize, Walmart, Kroger, Mondelez, Nestlé, and PepsiCo) committed to the 10x20x30 initiative, with the goal cutting their food waste in half by 2030.[317]

- This criterion helps achieve TR Art 13.1.(a) (i.e. *use natural resources, including sustainably sourced bio-based and other raw materials, in production more efficiently, including by: (i) reducing the use of primary raw materials or increasing the use of by-products and secondary raw materials; or (ii) resource and energy efficiency measures*).

- This criterion helps prevent or reduce waste generation, TR Art 13.1.(g).

B. The primary, secondary and tertiary food/beverage packaging material feedstock choice and design supports recycling, and food loss & waste is minimised.

This set of criteria is developed in line with the ambition of the EU CEAP 2020: "*All packaging on the EU market is reusable or recyclable in an economically viable way by 2030*".

B.1. Recycled or renewable feedstock

- As fossil feedstocks cannot be regenerated in any reasonable timescale, their extraction and use is a linear process and cannot be therefore part of a long-term solution. Moving towards a circular economy for packaging requires that, over time, food/beverage packaging use is decoupled from non-renewable resource extraction and does not deplete renewable resource stocks.

- The demand for recycled content is stimulated through this criterion, the supply through the next one. In this way, the entire system incentivised to scale, and make recycling work in practice. This criterion supports increased use of secondary raw materials and their quality, including by high-quality recycling of waste, TR Art 13.1.(f). While in a circular economy it is encouraged that pre-consumer waste is kept in the system, e.g. by replacing virgin resources

[317] See, e.g. https://www.fooddive.com/news/nearly-200-companies-pledge-to-halve-food-waste-by-2030/585873/

for the same process, the priority is to avoid such pre-consumer waste as part of optimising manufacturing processes in the first place, and less about substantial contribution to the circular economy. Circular economy is about transforming entire sectors to ensure material and products are kept at their highest value, e.g. through reusable packaging / recycling system connecting different steps of the value chain. Moreover, including recycling of pre-consumer waste in the recycled content calculation could create the perverse effect of incentivising the production of such industrial waste, harming the circular economy objective. Recycled content should therefore exclude pre-consumer recycled content. ISO 14021 clearly differentiates pre-consumer and post-consumer recycled content, with the former being about materials diverted from the waste stream during a manufacturing process.

- 'Chemical recycling' covers a broad range of technologies (e.g. from depolymerisation to pyrolysis). Currently there is limited evidence on material loss during such a process, hence an additional requirement is provided to ensure performance in line with existing mechanical recycling technologies. The quality of the output (not to be used as fuel, but as material of similar or better quality than mechanically recycled material) is guaranteed by the criteria itself (i.e. used as recycled content for food packaging, i.e. high quality material). Inclusion of CCU is currently under debate. GHG conditions on are provided in DNSH.

- In order to avoid unintended consequences, it is important to ensure for all renewable feedstock that responsible sourcing and regenerative production methods are applied.

- Threshold of 85 % with multiple examples existing on the market, but with even best cases often achieve 98-99% due to current use of virgin non-renewable material for, e.g. labelling adhesives or colouring.

- A typical screw cap of a PET bottle may have a mass of 2 to 3g, very roughly about a tenth of the respective bottle body.[318]

- The availability of recycled input for plastic bottles, and their caps and lids, will be supported, for example, by Directive (EU) 2019/904, including measures on product requirements (Article 6, ensuring the caps and lids remain attached to the containers), extended producer responsibility (Article 8), and awareness raising measures (Article 10), and there will be a

[318] Markus Gall, Andrea Schweighuber, Wolfgang Buchberger and Reinhold W. Lang, *Plastic Bottle Cap Recycling—Characterization of Recyclate Composition and Opportunities for Design for Circularity,* MDPI (2020)

requirement for separate collection for recycling (Article 9) of plastic beverage bottles including their caps and lids. The separate collection target for single-use plastics beverage bottles is 77 % of single-use plastic beverage bottles placed on the market by weight by 2025, and 90 % by 2029.

- To ensure a good estimate of the actual recycled content contained in final products placed on the market, claims on recycled content should be made using a batch level mass balance method. Such a method is easier to check, more credible, and more transparent towards consumers.

B.2. Design for recycling in practice

See A.2 above

B.3. Food/beverage loss & waste reduction:

See A.3 above

2.20 Finishing of textiles

Description of the activity

Textile finishing processes aim at improving the properties of textile materials e.g. to enhance their appearance, improve their durability and/or to provide special features. The finishing process is based on a series of steps including pre-treatment (such as desizing, washing, scouring, or bleaching); colouring (dyeing and/or printing) and functional finishing (such as waterproofing, coating, rubberising, or impregnating) of textile fibres, yarns, fabrics and textile articles, including wearing apparel.

The activity is classified under NACE code C13.30 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006 with the following exemptions:

- Finishing processes for the manufacture of non-wovens and articles made from non-wovens, except apparel, as classified under NACE code C13.95
- Finishing processes for the manufacture of other technical and industrial textiles as classified under NACE code C13.96

- Finishing processes for the manufacturing of Personal Protective Equipment (PPE) as established by the Regulation (EC) No 2016/425

Substantial contribution to Pollution prevention and control

The economic activity complies with all of the following criteria below.

1- Safe and efficient management of water and chemicals

The activity complies with one of the following criteria:

- All industrial facilities and installations for textile finishing in scope of the economic activity are certified in line with Regulation EC 1221/2009, which establishes the European Union eco-management and audit scheme (EMAS, or according to ISO 14001.

- Both internal documentation and external audit reports are provided, which confirm that there is an environmental management system (EMS) in place that incorporates all of the following elements:

    - Commitment, leadership, and accountability of the management, including senior management, to the implementation of an effective EMS;

    - Development of an environmental policy that includes the continuous improvement of the environmental performance of all industrial facilities and installations for textile finishing in scope of the economic activity;

    - Objectives, best practices and performance indicators in relation to the safe and efficient use of water and chemicals in the manufacturing processes;

    - Description of the relevant processes and capabilities identified and measures applied to prevent, eliminate or reduce wastewater and pollution;

    - Internal auditing and at least annual, independent external auditing to assess the environmental performance and to determine whether or not the EMS conforms to planned objectives and arrangements, and that it has been properly implemented, maintained and updated, including the application of sectoral benchmarking.

2- Restrictions for the use of substances of very high concern (SVHC) and other critical chemicals, including on the biodegradability of auxiliaries and finishing agents for fibres and yarns

The activity complies with the following criteria:

- An inventory of all chemical inputs and outputs is in place. This chemicals inventory is computer-based and contains information from the Safety Data Sheets and Technical Data Sheets, including the status of the chemicals under the EU REACH and CLP regulations. of the chemicals. It includes information about the identity of the process chemicals as well as the quantities, location and perishability of the process chemicals procured, recovered, stored, used and returned to suppliers.

- A declaration of compliance with all the following criteria from each dyeing, printing and finishing production site and from their chemical suppliers is provided, based on the inventory of all chemical inputs and outputs:

    a. Dyes and textile auxiliaries do not contain any substances which are identified as SVHC under the European Chemicals Regulation REACH (1907/2006/EC) and which have been incorporated into the list drawn up in accordance with Article 59, Paragraph 1 of the REACH Regulation (so-called "list of candidates"). If the substance is part of a preparation (a mixture), its concentration must not exceed 0.10% by mass. If a stricter, more specific concentration limit is specified for a substance in a mixture in the CLP Regulation (EC/1272/2008) then this is valid.

    b. Dyes and textile auxiliaries comply with the limit values in Chapter 1 of the ZDHC Manufacturing Restricted Substance List (MRSL), Version 2.0.[319]

    c. No dyes and textile auxiliaries are used, which according to the criteria of Regulation (EC) No 1272/2008 are assigned the H Phrases listed in Supplementary Material-1 section or which meet the criteria for such classification.

    d. The use of perfluorinated and polyfluorinated chemicals (PFCs) is not permitted.

[319] https://mrsl.roadmaptozero.com/

e. The following are exempt from requirements a) and c): Impurities in concentrations that are not specified in the safety data sheet. The components listed on the safety data sheet comply with the regulations according to Annex II, No. 3, of the REACH regulation (EC/1907/2006). If the substance in this case is part of a mixture, then its concentration does not exceed the general generic cut-off values according to the CLP Regulation (EC/1272/2008), or it meets a stricter concentration limit if specified.

- Where substances covered in the Supplementary Material-2 section are derogated, these substances are identified and supporting evidence is provided on how the derogation conditions in the Supplementary Material-2 section are met.

- At least 95% (dry weight) of the components of any sizing preparation applied to yarns are sufficiently biodegradable or recycled. The sum of the individual components is considered. In the case of spinning solution additives, spinning auxiliaries and preparation agents for primary spinning (including carding oils, spin finishes and lubricants), at least 90% (dry weight) of the components are sufficiently biodegradable or eliminable in wastewater treatment plants. The economic activity complies with the verification requirements in Supplementary Material-3 section.

Finishing processes for textile products certified by the German Blue Angel Ecolabel (DE-UZ 154) are considered to be compliant. Finishing processes for textile products certified by the EU Ecolabel (2014/350/EU) are considered to be compliant if a declaration of compliance with the ZDHC MRSL Version 2.0 is provided in addition.

Depending on the ecological status of the potentially affected ecosystems (e.g. water body), the relevant authorities may require further restrictions for the use of specific hazardous substance in the textile finishing processes in scope of the economic activity. In this case, a declaration of compliance with the requirements as set out in the legal permit is provided.

3- Optimisation of water use, including reuse and recycling of process water

The activity complies with all of the following criteria:

- The activity implements measures to minimise the amounts of partial wastewater streams, including through retention or reuse, which contain high loads of pollutants that cannot be adequately treated by biological treatment, such as:

- Synthetic size products from desizing,
- Left-over dye liquors,
- Left-over finishing padding baths,
- Left-over baths from coating and backing,
- Left-over printing pastes.

- The activity applies countercurrent rinsing and washing, low volume application systems (like flex-shaft, U-shaft) for continuous processes, and low liquor ratios for batch processes:
  - for woven PES fabric a minimum liquor ratio of 1:2
  - for woven cotton fabric a minimum liquor ratio of 1:4

A declaration of compliance is provided.

4- Wastewater quality and treatment

The activity complies with one of the following criteria:

- The activity reduces emissions to water by optimizing the textile finishing processes within the scope of the economic activity and onsite wastewater treatment if required so that the direct water discharge meets the threshold levels in the Supplementary Material-4 section.
- The activity reduces emissions to water by connecting to a Common Effluent Treatment Plant, ensuring that the threshold levels in the Supplementary Material-5 section for indirect discharge are met.

In addition, the activity complies with one of the following criteria:

- Reports on regular monitoring of the relevant parameters in Supplementary Material-4 or 5 section respectively by analysis of wastewater samples or online measurements to ensure compliance are provided. If discharged to a common wastewater treatment plant, a notice of approval for the textile finishing plant is provided verifying that the discharge

process has been approved and that the urban wastewater treatment plant meets at least the requirements of Directive 91/271/EEC.

- A declaration of compliance with the threshold limits for direct water discharge is provided as set out in the ZDHC Wastewater Guidelines Version 1.1 or newer (Appendix A, Tables 1A-1B: Conventional Parameters for Wastewater - progressive levels)[320] or STeP by OEKO-TEX® Edition 01.2021 or newer (Annex 5: Limit value for wastewater effluents - advanced levels).[321]

Depending on the ecological status of the potentially affected water body or bodies, the relevant authorities may require the textile finishing facilities in scope of the economic activity to comply with stricter values than the ones in the Supplementary Material-4 or 5 section. In this case, a declaration of compliance with the threshold limits as required in the legal permit is provided.

Supplementary Material-1 section : H-Phrases according to Regulation (EC) No. 1272/2008 (CLP Regulation)

(Source: German Blue Angel Ecolabel - Basic Award Criteria for Textiles DE-UZ 154 - Edition July 2017 - Version 1.8)

Toxic substances

- H300 - Fatal if swallowed
- H301 - Toxic if swallowed
- H304 - May be fatal if swallowed and enters airways
- H310 - Fatal in contact with skin
- H311 - Toxic in contact with skin
- H330 - Fatal if inhaled
- H331 - Toxic if inhaled

[320] https://www.roadmaptozero.com/post/updated-zdhc-wastewater-guidelines-v1-1-released
[321] https://www.oeko-tex.com/en/our-standards/step-by-oeko-tex

- H370 - Causes damage to organs
- H371 - May cause damage to organs
- H372 - Causes damage to organs through prolonged or repeated exposure

Carcinogenic, mutagenic and reprotoxic substances

- H340 - May cause genetic defects
- H341 - Suspected of causing genetic defects
- H350 - May cause cancer
- H350i - May cause cancer if inhaled
- H351 - Suspected of causing cancer: Except titanium dioxide, because its classification only applies to inhalable powders.
- H360F - May damage fertility
- H360D - May damage the unborn child
- H360FD - May damage fertility / May damage the unborn child,
- H360Fd - May damage fertility / Suspected of damaging the unborn child
- H360Df - May damage the unborn child / Suspected of damaging fertility
- H361f - Suspected of damaging fertility
- H361d - Suspected of damaging the unborn child
- H361fd - Suspected of damaging fertility / Suspected of damaging the unborn child
- H362 - May cause harm to breast fed children

Water-hazardous substances

- H400 - Very toxic to aquatic life
- H410 - Very toxic to aquatic life with long-lasting effects

- H411 - Toxic to aquatic life with long-lasting effects
- H412 - Harmful to aquatic life with long lasting effects
- H413 - May cause long lasting harmful effects to aquatic life

Other Health and Environmental Effects

- H420 - Harms public health and the environment by destroying ozone in the up-per atmosphere (replaces EUH059) according to Commission Regulation (EC) No 286/2011 of 10 March 2011 amending Regulation (EC) No 1272/2008

Sensitizing substances

- H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled
- H317 - May cause an allergic skin reaction

Supplementary Material-2 section: Derogated hazard classifications by substance group, including derogation conditions

(Source: German Blue Angel Ecolabel - Basic Award Criteria for Textiles DE-UZ 154 - Edition July 2017 - Version 1.8)

Substance group	Hazard classification affected by the derogation	Derogation conditions
Auxiliaries including carriers, fastness enhancers, levelling agents, dispersing agents, surfactants, thickeners, binding agents	• H317 - May cause an allergic skin reaction • H371 - May cause damage to organs • H372 - Causes damage to organs through prolonged or repeated exposure • H411 - Toxic to aquatic life	The recipes must be formulated us automatic metering systems and process must follow standard opera procedures. H317 (1B) substar added to the recipe must not hav higher concentration than 0.1% by mass in the final product.

	with long lasting effects • H412 - Harmful to aquatic life with long lasting effects • H413 - May cause long lasting harmful effects to aquatic life	
Enzymatic desizing agents	• H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled	The recipes must be formulated using automatic metering systems and the process must follow standard operating procedures. A safety data sheet of the desizing agent is to be submitted.
Dyes for dyeing and non-pigment printing	• H301 - Toxic if swallowed • H311 - Toxic in contact with skin • H331 - Toxic if inhaled • H317 - May cause allergic skin reactions • H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled • H411 - Toxic to aquatic life with long lasting effects • H412 - Harmful to aquatic life with long lasting effects • H413 - May cause long lasting effects to aquatic life	Dyeing processes using reactive, direct, vat and sulphur dyes with these classifications must meet at least one of the following conditions: • Use of high affinity dyes • Achievement of a reject rate of less than 3.0% • Use of colour matching instrumentation • Use of standard operating procedures for the dyeing process • Use of colour removal to treat wastewater Solution dyes and/or digital printing are excluded from these conditions.

		Dye houses and printers must use dust free dye formulations or automatic dosing and dispensing of dyes to minimise worker exposure.

Supplementary Material-3 section: Biodegradability of auxiliaries and finishing agents for fibres and yarns

(Source: BLUE ANGEL The German Ecolabel for Textiles, DE-UZ 154, Basic Award Criteria Edition July 2017, Version 1.8, Chapter 3.2.3 -

https://produktinfo.blauer-engel.de/uploads/criteriafile/en/DE-UZ%20154-201707-en-Criteria-V1.8.pdf)

Substance group	**Scope of restriction**	**Limit values**	**Compliance verification**
i) Sizing preparations applied to fibres and yarns Applicability: Spinning processes	At least 95% (by dry weight) of the components are readily biodegradable. In all cases, the sum of the individual components is taken into account.	**Readily biodegradable**: 70% degradation of dissolved organic carbon within 28 days or 60% of theoretical maximum oxygen depletion or carbon dioxide generation within 28 days	Declaration from the chemical supplier supported by OECD or ISO test results Test methods: OECD 301 A, ISO 7827 OECD 301 B, ISO 9439 OECD 301 C, OECD 301 D, OECD 301 E, OECD 301 F, ISO 9408 OECD 310, ISO 14593 ISO 10708

ii) Spinning solution additives, spinning additives and preparation agents (Including carding oils, spin finishes and lubricants) Applicability: Primary spinning pro cesses	At least 90% (by dry weight) of the components are readily biodegradable, inherently biodegradable or eliminable in wastewater treatment plants. In all cases, the sum of the individual components is taken into account.	**Readily biodegradable:** See definition under i) **Inherently biodegradable:** 80% degradation of dissolved organic car bon within 7 days (possibly 28 days). **Eliminability in laboratory clarification units:** 80% degradation of dissolved organic carbon (plateau phase)	Declaration from the chemical supplier supported by OECD or ISO test results Test methods: See compliance verifications under i) readily biodegradable tests. Inherently biodegradable tests that are accepted: OECD 302 B, ISO 9888 OECD 302 C Tests for eliminability in laboratory clarification units: OECD 303A/B, ISO 11733

This degree of biodegradation is achieved within 10 days of the beginning of the degradation phase starting with the day when 10% of the substance has been degraded, unless the substance has been identified as a UVCB (unknown or variable compositions, complex reaction products or biological materials) or as a complex multi-constituent substance with structurally similar constituents. In this case, and when there is sufficient reason, the 10-day window are not applied, and the 28-day result is applicable instead. The economic activity provides a list of all spinning solution additives, spinning auxiliaries and preparation agents for primary spinning (including carding oils, spin finishes and lubricants) and their manufacturers. In addition, the declarations from the chemical suppliers and the corresponding test reports, or safety data sheets, indicating the tests used to investigate the substances and their results, are provided.

The corresponding ISO standards and REACH methods (Regulations EC 440/2008 and EC 761/2009) are recognized as equivalent.

Supplementary Material-4 section: Thresholds for the quality of direct water discharge (in mg/l unless otherwise noted)

Taking into account of the environmental ambition levels as defined in the latest version of the EU Textile BREF, STeP by Oekotex Edition 01.2021 (advanced level) and the ZDHC Wastewater Guidelines V1.1 (progressive level)

- AOX (Adsorbable Organically bound halogen): 0.5
- COD: 80 **OR** TOC: 30
- HOI (Hydrocarbon Oil Index): 2
- Sb: 0.05
- Cr: 0.05
- Cu: 0.25
- Ni: 0.2
- Zn: 0.5
- S^{2-}: 1
- total N: 10
- total P: 0.5
- TSS: 15
- pH 6-9
- BOD5: 15
- Coliform (bacteria/ml): 100

Supplementary Material-5 section: Thresholds for the quality of indirect water discharge (in mg/l unless otherwise noted)

Taking into account of the environmental ambition levels as defined in the latest version of the EU Textile BREF, STeP by Oekotex Edition 01.2021 (advanced level) and the ZDHC Wastewater Guidelines V1.1 (progressive level)

- AOX (Adsorbable Organically bound halogen): 0.5
- HOI (Hydrocarbon Oil Index): 2
- Sb: 0.05
- Cr: 0.05
- Cu: 0.25
- Ni: 0.2
- Zn: 0.5
- S^{2-}: 1

Do no significant harm ('DNSH')

(1) Climate change mitigation	The direct GHG emissions for generation of heat and/or power for the textile finishing processes in scope of the economic activity are lower than 270gCO2e/kWh.
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.
(3) Sustainable use and protection of	The economic activity complies with all of the following criteria: • Environmental degradation risks related to preserving water quality and avoiding water stress are identified and addressed

water and marine resources	with the aim of achieving good water status and good ecological potential as defined in Article 2, points (22) and (23), of Regulation (EU) 2020/852, in accordance with Directive 2000/60/EC of the European Parliament and of the Council[322] and a water use and protection management plan, developed thereunder for the potentially affected water body or bodies, in consultation with relevant stakeholders. • All water sources are classified in terms of their sensitivity, either designated as a protected area, nationally or internationally, regardless the amount of water abstracted, or recognized as 'sensitive' by a professional due to their relative size in m3. Groundwater is considered as a sensitive source per se. For each sensitive water source, it is defined if the maximum abstraction rates coincide with periods of water stress of the source. And relate the water discharge per period with water stress periods. The Water Stress Index (WSI) of a source can be measured by calculating collective water abstraction in relation to the available water per source (with the water abstraction volume per source in [m3/month or sensitive period] and [average m3/year]). Long Term Average Available (LTAA) water are available at the River Basin Committee Authorities. • Sustainable levels of water abstraction are subject to a permit in accordance with the Directive 2000/60/EC. At company level, a dedicated water management plan is in place, and water audits are carried out at least annually to ensure that the objectives of

[322] Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy (OJ L 327, 22.12.2000, p. 1). For activities in third countries, in accordance with applicable national law or international standards which pursue equivalent objectives of good water status and good ecological potential, through equivalent procedural and substantive rules, i.e. a water use and protection management plan developed in consultation with relevant stakeholders which ensures that 1) the impact of the activities on the identified status or ecological potential of potentially affected water body or bodies is assessed and 2) deterioration or prevention of good status/ecological potential is avoided or, where this is not possible, 3) justified by the lack of better environmental alternatives which are not disproportionately costly/technically unfeasible, and all practicable steps are taken to mitigate the adverse impact on the status of the body of water.

	the water management plan are met. The water management plan includes flow diagrams and a water mass balance of the plant and processes in scope of the economic activity, the establishment of water efficiency objectives, and the implementation of water optimisation techniques such as control of water usage, reuse or recycling of process water, detection and repair of leaks. The water management plan and the water audits may be integrated and documented in the overall water management plan of a larger industrial site (e.g. cluster of textile plants). • In addition, a stormwater management plan is in place to mitigate harmful overflows from the wastewater collection system which may include installation of separate retention tanks or a rainwater harvesting system or an equivalent. Sewage sludge is used in accordance with Council Directive 86/278/EEC or as required by national law relating to the spreading of sludge on the soil or any other application of sludge on and in the soil. Where an Environmental Impact Assessment is carried out in accordance with Directive 2011/92/EU of the European Parliament and of the Council[5] and includes an assessment of the impact on water in accordance with Directive 2000/60/EC, no additional assessment of impact on water is required, provided the risks identified have been addressed.
(4) Transition to a circular economy	The activity assesses availability of and adopts techniques that support: (a) reuse and use of secondary raw materials, as well as re-used or recycled water and chemicals (b) design for high durability, recyclability, easy disassembly and upgradability of textiles

	(c) waste management that prioritises recycling over disposal, in the manufacturing process (d) information on and traceability of substances of concern throughout the lifecycle of the textiles
(6) Protection and restoration of biodiversity and ecosystems	An Environmental Impact Assessment (EIA) or screening[323] has been completed in accordance with Directive 2011/92/EU[324]. Where an EIA has been carried out, the required mitigation and compensation measures for protecting the environment are implemented. For sites/operations located in or near biodiversity-sensitive areas (including the Natura 2000 network of protected areas, UNESCO World Heritage sites and Key Biodiversity Areas, as well as other protected areas), an appropriate assessment[325], where applicable, has been conducted and based on its conclusions the necessary mitigation measures[326] are implemented.

[323] The procedure through which the competent authority determines whether projects listed in Annex II to Directive 2011/92/EU is to be made subject to an environmental impact assessment (as referred to in Article 4(2) of that Directive).

[324] For activities in third countries, in accordance with equivalent applicable national law or international standards requiring the completion of an EIA or screening, for example, IFC Performance Standard 1: Assessment and Management of Environmental and Social Risks.

[325] In accordance with Directives 2009/147/EC and 92/43/EEC. For activities located in third countries, in accordance with equivalent applicable national law and international standards, that aim at the conservation of natural habitats, wild fauna and wild flora, and that require to carry out (1) a screening procedure to determine whether, for a given activity, an appropriate assessment of the possible impacts on protected habitats and species is needed; (2) such an appropriate assessment where the screening determines that it is needed, for example IFC Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources.

[326] Those measures have been identified to ensure that the project, plan or activity will not have any significant effects on the conservation objectives of the protected area.

Rationale

Description of the activity

- Pollutant emissions can occur across the entire textiles and wearing apparel value chain, starting from fiber production up to treatment of textile waste after use. Although textile finishing is only one of the many manufacturing steps in the value chain, it has been identified as the main environmental hotspot related to pollution prevention and control.

- Textile finishing is a wet process which uses water, energy and chemicals. Technologies for closed-loop re-use of chemicals and water, for minimization of emissions and for wastewater treatments exist and are widely use in Europe as the field analysis carried out under the BREF-review process shows: https://eippcb.jrc.ec.europa.eu/reference/textiles-industry

- Depending on the technologies applicable/ used and regulations in place, textile finishing processes can have a very high or very low ecological footprint in terms of water usage and discharge of volumes of hazardous substances into water streams posing a risk to the survival of aquatic life.

- The scope of the activity has been further limited due to the broad variety of highly specialised applications for technical textiles with specific finishing requirements which are not able to meet the ambition level outlined for substantial contribution in this proposal. Instead of defining even more detailed derogations, a separate set of criteria for these currently excluded categories may be considered in the future work of the platform.

- Emissions into air and soil are of minor relevance compared to emissions into water.

Technical screening criteria SC

Safe and efficient management of water and chemicals

- Due to the large variety of textiles finishing processes and chemicals being used therein, it is challenging to define Technical Screening Criteria that can be applied across the sector in a generic way. It is also important to stress that textiles finishing companies are very often SMEs that cover an enormous variety of specialty products to manufacture high-performance textiles and which requires tailored technologies. Hence,

not all best available technologies can be applied “plug & play” to all processes but companies need to tailor technology solutions (when available) to the specific needs of the process and of the product.

- Therefore, the proposal promotes a continuous improvement process through the establishment of an environmental management system as the starting point to ensure a safe and efficient use of water and chemicals during textiles finishing. This approach can support measures to reduce the pressure on water resources. Additionally, less water use may translate into less use of chemicals, and hence indirectly lowering the impact of pollution load on the water bodies.

- While an EMS may be standard practice in the EU, it certainly constitutes a substantial contribution to pollution prevention and control outside the EU.

Restrictions for the use of substances of very high concern (SVHC) and other critical chemicals

- Innovative finishing, printing and dyeing techniques can reduce the use of chemicals at source, phasing out the use of hazardous and persistent chemicals, and replacing them with available non-toxic and biodegradable chemicals.

- Criterion 2 aims to achieve a comparable ambition level as inscribed for example in the relevant criteria of the EU Ecolabel and the German Blue Angel scheme for consumer textile products.

Optimisation of water use, including reuse and recycling of process water

- The use of closed-loop process water systems and technologies for the recycling of wastewater will contribute significantly to pollution prevention and control. However, no sufficient data was available to establish a threshold for a generic reuse or recycling rate of process water for all the textile finishing processes within scope of the economic activity.

- Instead, process-based criteria have been formulated in line with the insights from the latest draft of EU Textile BAT recommendations.

Wastewater quality and treatment

- This criterion aims to improve the quality of water discharge and/ or the use of effective wastewater treatment technologies, aiming at a comparable environmental ambition level to the ones defined in reputed industry guidelines and standards such as the recently updated ZDHC Wastewater Guidelines V1.1 (progressive level) or the latest version of the STeP by OEKO-TEX® (advanced level).

- The final decision on the adequate threshold levels may only be decided once the still ongoing revision process for the EU BAT Reference document (BREF) for the Textiles Industry has been completed, addressing installations for the pretreatment (operations such as washing, bleaching, mercerisation) or dyeing of fibres or textiles: https://eippcb.jrc.ec.europa.eu/reference/textiles-industry

Reduction of microfiber release

- Currently, there are no standards available that allow to define a substantial contribution of the textile industry to reduce microfiber release at this stage.

- Additional criteria on substantial contribution to prevent and control of microfiber pollution have to be formulated in the following areas: Parameters for textile design (fibre length, yarn spinning, weaving, fabric construction), Finishing treatments and dyeing processes, and industrial pre-washing of items including effective filtration systems.

Technical screening criteria DNSH

Except for the protection and sustainable use of freshwater, the current proposal for DNSH criteria builds mostly on generic formulations used in the DNSH criteria in the EC delegated act on climate change mitigation and adaptation under the EU Taxonomy Regulation (EU) 2020/852.

--> Feedback welcome on the need to develop more specific DNSH criteria for textile finishing facilities and processes.

2.21 Manufacture, repair, refurbishment and resale of wearing apparel

Description of the activity

Manufacture of Wearing Apparel includes all tailoring (ready-to-wear or made-to-measure), in all materials except fur (e.g., leather, fabric, knitted and crocheted fabrics etc.), of all items of clothing (e.g. outerwear, underwear for men, women or children; work, city or casual clothing etc.) and accessories, except footwear. There is no distinction made between clothing for adults and clothing for children, or between modern and traditional clothing. The activity is classified under NACE codes C14, in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

The scope includes both manufacturing of new wearing apparel and refurbishment of used, out-dated or no longer functional wearing apparel within the defined scope of NACE code 14. The latter can be understood as a process to bring the products to a condition and performance, after which they can re-enter the market substituting the purchase of newly produced wearing apparel.[327] When wearing apparel is refurbished, it is disassembled to the component level and rebuilt, replacing components where necessary to improve the condition and level of performance.

Repair and alteration of clothing is classified as part of NACE code S95.29 Repair of other personal and household goods, and they should be covered only to the extent that these economic activities relate to products manufactured within scope of NACE code C14, in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

The following economic activities related to wholesale and retail are only covered to the extent that they relate to products manufactured within scope of NACE code C14. They are classified under following NACE codes, in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006:

- G46.42 Wholesale of clothing and footwear
- G47.71 Retail sale of clothing in specialised stores

[327] See EUROPEAN COMMISSION Brussels, 4.3.2019 SWD(2019) 91 final COMMISSION STAFF WORKING DOCUMENT Sustainable Products in a Circular Economy and What is Remanufacturing and how does it benefit jobs, the economy and the environment?

- G47.79 Retail sale of second-hand goods in stores
- G47.82 Retail sale via stalls and markets of textiles, clothing and footwear
- G47.91 Retail sale via mail order houses or via Internet

Substantial contribution to transition to a circular economy

To contribute substantially to the circular economy, the economic activity in scope has to comply with at least one of three criteria sets (A, B, or C) below.

- Criterion A covers repairing, refurbishment, and/or reselling used wearing apparel, and the economic activity has to comply with either criterion A.1 or A.2.
- Criterion B covers design and manufacturing of new wearing apparel, and the economic activity has to comply with all criteria B.1 to B.4 cumulatively.
- Criterion C covers clothing rental and other product-as-a-service models for wearing apparel.

There can be overlaps between the economic activities covered criteria sets A, B and C, as these are not mutually exclusive.

A. Repair, refurbishment and/ or resale of used wearing apparel

The economic activity complies with at least one of the following criteria:

A.1 The economic activity will extend the lifetime of wearing apparel by providing repair and/ or alteration services, including

- basic repairs, including repairing seam splits and stitching;
- the replacement of broken/ lost parts and the fixing/replacement of zips and fasteners;
- the replacement of damaged parts of the fabric;
- and/or the retreating and proofing of functional coatings.

The economic activity includes repair of wearing apparel that has been damaged either during the production process or during normal wear. It also applies to the alteration of garments following production, where they do not fit an individual.

A.2 The economic activity will extend the lifetime of wearing apparel already used by a customer (individual or organisation) through reselling to a new customer, including prior repair, refurbishment and/or cleaning activities of damaged garments as needed. The activity includes defining minimum standards for sorting and classification of wearing apparel to maximise the value obtained from reuse, refurbishment, or recycling as a last resort. The economic activity allows the customer to return the products within scope for a repair, replacement or refund during a minimum [6] months period after purchase.

B. Design and manufacturing of new wearing apparel

The economic activity includes manufacture of wearing apparel that complies with all of the following criteria

B.1 Durability

The manufactured wearing apparel meets the relevant durability requirements identified below, covering

- Dimensional changes during washing and drying
- Colour fastness to washing
- Colour fastness to perspiration (acid, alkaline)
- Colour fastness to wet rubbing
- Colour fastness to dry rubbing
- Colour fastness to light
- Fabric resistance to pilling and abrasion
- Durability of function

For each distinct product design reports from tests carried out in accordance with the standards specified in the table below are provided. The reports verify that each product type or model meets the specified durability requirements. The manufacture of wearing apparel products

certified by the EU Ecolabel, the German Blue Angel Ecolabel or Nordic Swan Ecolabel are compliant with B1.

Dimensional changes during washing and drying

The dimensional changes after washing and drying at either domestic or industrial washing temperatures and conditions shall not exceed those specified in the table below.

Textile products or type of material	Dimensional changes during washing and drying
Knitted fabrics	± 4,0 %
Chunky knit	± 6,0 %
Interlock	± 5,0 %
Woven fabrics:	
— Cotton and cotton mix	± 3,0 %
— Wool mix	± 2,0 %
— Synthetic fibres	± 2,0 %
Socks and hosiery	± 8,0 %

This criterion does not apply to:

(a) fibres or yarn;

(b) products clearly labelled ‘dry clean only’ or equivalent;

Assessment and verification: the applicant shall provide test reports using the standards appropriate for the product.

For domestic washing EN ISO 6330 in combination with EN ISO 5077 shall be used as follows: three washes at temperatures as indicated on the product, with tumble drying after each washing cycle.

For commercial washing in industrial laundries ISO 15797 in combination with EN ISO 5077 shall be used at a minimum of 75 °C or as indicated in the standard for the fibre and bleaching combination. Drying shall be as indicated on the product label.

Alternatively for removable and washable mattress ticking EN ISO 6330 in combination with EN 25077 shall be used. The default conditions shall be washing 3A (60 °C) and drying C (flat drying) unless the product label states otherwise.

Colour fastness to washing

The colour fastness to washing shall be at least level 3-4 for colour change and at least level 3-4 for staining.

This criterion does not apply to products labelled ‘dry clean only’ or equivalent (in so far as it is normal practice for such products to be so labelled), to white products or products that are neither dyed nor printed.

Assessment and verification: for domestic washing the applicant shall provide test reports using the test method: ISO 105 C06 (single wash, at temperature as marked on the product, with perborate powder).

For commercial washing in industrial laundries ISO 15797 in combination with ISO 105 C06 shall be used at a minimum of 75 °C or as indicated in the standard for the fibre and bleaching combination.

Colour fastness to perspiration (acid, alkaline)

The colour fastness to perspiration (acid and alkaline) shall be at least level 3-4 (colour change and staining). A level of 3 is nevertheless allowed when fabrics are both dark coloured (standard depth > 1/1) and made of regenerated wool. This criterion does not apply to white products, to products that are neither dyed nor printed, to furniture fabrics, curtains or similar textiles intended for interior decoration.

Assessment and verification: the applicant shall provide test reports using the following test method: ISO 105 E04 (acid and alkaline, comparison with multi-fibre fabric).

Colour fastness to wet rubbing

The colour fastness to wet rubbing shall be at least level 2-3. A level of 2 is allowed for dark coloured denim and a level of 1 for all other denim colour shades.

This criterion does not apply to white products or products that are neither dyed nor printed.

Assessment and verification: the applicant shall provide test reports using the following test method: ISO 105 X12.

Colour fastness to dry rubbing

The colour fastness to dry rubbing shall be at least level 4. A level of 3-4 is allowed for dark coloured denim and a level of 2-3 for all other denim colour shades.

This criterion does not apply to white products or products that are neither dyed nor printed.

Assessment and verification: the applicant shall provide test reports using the following test method: ISO 105 X12.

Colour fastness to light

Colour fastness to light shall be at least level 4.

This requirement does not apply to underwear.

Assessment and verification: the applicant shall provide test reports using the following test method: ISO 105 B02.

Fabric resistance to pilling and abrasion

Non-woven fabrics and knitted garments, accessories and blankets made of wool, wool blends and polyester (including fleece), shall resist pilling to a rating of a minimum of 3.

Woven cotton fabrics used for garments shall resist pilling to a rating of a minimum of 3. Polyamide tights and leggings shall resist to a rating of a minimum of 2.

The manufacturer shall provide reports from tests carried out as appropriate to the substrate:

- Knitted and non-woven products: ISO 12945-1 Pill box method
- Woven fabrics: ISO 12945-2 Martindale method

Durability of function

Finishes, treatments and additives that impart water, oil and stain repellency to the textile product when it is in use shall be durable according to the values and parameters set out below.

For water, oil and stain repellents consumers shall be provided with guidance on how to maintain the functionality of finishes applied to the product.

Textile fibres, fabrics and membranes that lend the final product intrinsic functional properties are exempt from these requirements.

For products with intrinsic properties applicants shall provide test reports demonstrating comparable or improved performance compared with alternatives that may be applied as finishes.

Water repellents shall retain a functionality of 80 out of 90 after 20 domestic wash and tumble dry cycles at 40 °C, or after 10 industrial washing and drying cycles at a minimum of 75 °C.

Oil repellents shall retain a functionality of 3,5 out of 4,0 after 20 domestic wash and tumble dry cycles at 40 °C, or after 10 industrial washing and drying cycles at a minimum of 75 °C.

Stain repellents shall retain a functionality of 3,0 out of 5,0 after 20 domestic wash and tumble dry cycles at 40 °C, or after 10 industrial washing and drying cycles at a minimum of 75 °C.

Industrial washing temperatures may be reduced to 60 °C for garments with taped seams.

The manufacturer shall provide reports from tests carried out according to the following standards, as appropriate to the product:

For all products domestic wash cycles ISO 6330 or industrial laundry cycles ISO 15797 in combination with:

- water repellents: ISO 4920
- oil repellents: ISO 14419
- stain repellents: ISO 22958

B.2 Design for disassembly, reuse and recycling

Garments are designed in a way that any additional component that is added to the fabric (such as accessories, metals, RFID, etc.) and any logos or distinctive identification features can be easily removed or overprinted without damaging the item. Clear, easy to understand instructions are provided for reuse contractors on how to remove such components or overprint logos or branding.

Considering the limitations of available recycling technologies, the economic activity complies with the following criteria:

- The wearing apparel does not contain blends of more than two different fibre types. If elastane is present and not one of the main fibre types, it does not exceed [2] % of the total fibre in weight.
- In the case of synthetic fibres only mono-material fabrics made of polyester or polyamide are compliant. Any additional share of elastane does not exceed [2] % of the total fibre in weight.
- In the case of wearing apparel containing polyester as one of the two fibre types present in the fabric, the design of the final textile product facilitates ease of separation for polyester fibres at the end of the product's life.
- In the case of cellulose-based fabrics, the second fibre type is limited to maximum [10] % of the total fibre weight. If the second fibre type is elastane, it is limited to maximum share of [2] %, hence ensuring [98] % cellulose-based content.

B.3 Restriction of hazardous chemicals, and biodegradability of auxiliaries and finishing agents for fibres and yarns

The final product does not contain the substances listed in the subsection B.3.1 at greater than the individual or sum total concentration limits, demonstrated by laboratory testing of a sample of each product type. The laboratory is accredited to carry out the relevant tests according to ISO 17025 or by the accreditation body for a textile testing scheme. Where the test methods are the same, test results from valid ISO Type I ecolabels, including the EU Ecolabel, as well as third-party textile testing schemes such as Standard 100 by Oeko-Tex, are accepted.

At least 95% (dry weight) of the components of any sizing preparation applied to yarns are sufficiently biodegradable or recycled. The sum of the individual components is considered. In the case of spinning solution additives, spinning auxiliaries and preparation agents for primary

spinning (including carding oils, spin finishes and lubricants), at least 90% (dry weight) of the components are sufficiently biodegradable or eliminable in wastewater treatment plants. The economic activity complies with the verification requirements in the subsection b.3.2.

The use of perfluorinated and polyfluorinated chemicals (PFCs) for textile finishing is not permitted.

B.3.1

This sub section consists of restrictions that apply to the following production stages in the textile supply chain:

(a) all production stages

(b) the final product

(a) *Restrictions applying to all production stages*

Substances of Very High Concern (SVHC's)			
(i) Substances that have been entered onto the ECHA Candidate List. Applicability All products.	SVHC's that have been identified according to Article 59 of Regulation (EC) No 1907/2006 (REACH) as meeting the criteria of Article 57 of that Regulation and are listed in the candidate list for eventual inclusion in Annex XIV of REACH ('Candidate List') that is current at the time of application shall not be present in the final product, either or to impart function to the final product or that have been intentionally used during production stages, unless a	n/a	Verification: Declaration of compliance by each production stage and their chemical suppliers.

	derogation has been approved. The current Candidate List can be consulted at: http://echa.europa.eu/web/guest/candidate-list-table No derogation from the exclusion in this criterion shall be given concerning substances identified as SVHC's and which have been entered onto the list foreseen in Article 59 of Regulation (EC) No 1907/2006, and which are present in the article or in any homogenous part of it in concentrations of more than 0,10 %.		
Detergents, surfactants, softeners and complexing agents			
(ii) All detergents, surfactants, fabric softeners and complexing agents Applicability: All wet processes	At least 95 % by total weight of all fabric softeners, complexing agents, detergents and surfactants used at each wet processing site shall be: — readily biodegradable under aerobic conditions, or — inherently biodegradable, and/or	n/a	Verification: Declaration chemical supplier supported by SDS and/or OECD or ISO test results Test method: See sizing and spinning agents

	— eliminable in wastewater treatment plants. The latest revision of the detergents ingredients database should be used as a reference point for biodegradability: http://ec.europa.eu/environment/ecolabel/documents/did_list/didlist_part_a_en.pdf		(subsection B.3.1 (a) i/ii)
(iii) Non-ionic and cationic detergents and surfactants Applicability: All wet processes	Non-ionic and cationic detergents and surfactants used at each wet processing site that are classified as hazardous to the aquatic environment according to Regulation (EC) No 1272/2008 shall be ultimately biodegradable under anaerobic conditions The detergents ingredients database should be used as a reference point for biodegradability: http://ec.europa.eu/environment/ecolabel/documents/did_list/didlist_part_a_en.pdf	n/a	Verification: Declaration from SDS and/or chemical supplier supported by OECD or ISO test results Test method: EN ISO 11734, ECETOC No 28 OECD 311
Auxiliaries			

(iv) Auxiliaries used in preparations and formulations. Applicability: All products.	The following substances shall not be used in any preparations or formulations used for textiles and are subject to limit values for their presence on the final product: Nonylphenol, mixed isomers 4-Nonylphenol 4-Nonylphenol, branched Octylphenol 4-Octylphenol 4-tert-Octylphenol	25 mg/kg sum total	Verification: Final product testing Test method: Solvent extraction followed by LCMS
	Alkylphenolethoxylates (APEOs) and their derivatives: Polyoxyethylated octyl phenol Polyoxyethylated nonyl phenol Polyoxyethylated p-nonyl phenol		Verification: Final product testing Test method: ISO 18254

	The following substances shall not be used in any textile preparations or formulations: bis(hydrogenated tallow alkyl) dimethyl ammonium chloride (DTDMAC) distearyl dimethyl ammonium chloride (DSDMAC) di(hardened tallow) dimethyl ammonium chloride (DHTDMAC) ethylene diamine tetra acetate (EDTA), diethylene triamine penta acetate (DTPA) 4-(1,1,3,3-tetramethylbutyl)phenol 1-Methyl-2-pyrrolidone Nitrilotriacetic acid (NTA)	n/a	Verification: Declaration of non-use from the chemical suppliers supported by SDS for all production stages.

(b) *Restrictions applying to the final product*

(i) Candidate List SVHC's that are derogated. Applicability: Elastane, acrylic	N,N-Dimethylacetamide (127-19-5) The following limit values apply to end products containing elastane and acrylic:		Verification: Final product testing Test method: Solvent extraction, GCMS or LCMS

	— Products for babies and children under 3 years old	0,001 % w/w	
	— Products that are in direct contact with the skin	0,005 % w/w	
	— Garments with limited skin contact and interior textiles	0,005 % w/w	
(ii) Formaldehyde residues Applicability: All products. Specific conditions apply to garments with easy care finishes (also referred to as non-crease or permanent press)	The following limit values apply to residual formaldehyde from easy care finishes:		Verification: Final product testing for products with an easy care finish. A declaration of non-use is required for all other products. Test method: EN ISO 14184-1
	— Products for babies and children under 3 years old.	16 ppm	
	— All products that are in direct contact with the skin	16 ppm	
	— Garments with limited skin contact and interior textiles	75 ppm	
(iii) Biocides used to protect textiles during transportation and storage. Applicability: All products	Only biocidal products that contain active substances that are approved under Regulation (EC) No 528/2012 of the European Parliament and of the Council ([1]) are permitted for use. Applicants should consult the most current authorisation list: https://echa.europa.eu/web/guest/information-on-chemicals/biocidal-active-substances The following substances are restricted:	n/a	Verification: Declaration of non-use prior to shipping and storage supported by SDS.

	— Chlorophenols (their salts and esters) — Polychlorinated biphenyls (PCB) — Organotin compounds, including TBT, TPhT, DBT and DOT — Dimethyl fumarate (DMFu)		
(iv) Extractable metals Applicability: All products with different limit values applying to babies and children under 3 years old.	The following limit values apply to products intended for babies and children under 3 years old:	mg/kg	Verification: Final product testing Test method: Extraction — EN ISO 105-E04-2013 (Acid sweat solution) Detection — ICP-MS or ICP-OES
	Antimony (Sb)	30,0	
	Arsenic (As)	0,2	
	Cadmium (Cd)	0,1	
	Chromium (Cr)		
	— Textiles dyed with metal complex dyes	1,0	
	— All other textiles	0,5	
	Cobalt (Co)	1,0	
	Copper (Cu)	25,0	
	Lead (Pb)	0,2	
	Nickel (Ni)		
	— Textiles dyed with metal complex dyes	1,0	

	— All other textiles	0,5	
	Mercury (Hg)	0,02	
	The following limit values apply to all other products including interior textiles:	mg/kg	Verification: Final product testing Test method: Extraction — DIN EN ISO 105-E04-2013 (Acid sweat solution) Detection — ICP-MS or ICP-OES
	Antimony (Sb)	30,0	
	Arsenic (As)	1,0	
	Cadmium (Cd)	0,1	
	Chromium (Cr)		
	— Textiles dyed with metal complex dyes	2,0	
	— All other textiles	1,0	
	Cobalt (Co)		
	— Textiles dyed with metal complex dyes	4,0	
	— All other textiles	1,0	
	Copper (Cu)	50,0	
	Lead (Pb)	1,0	
	Nickel (Ni)	1,0	
	Mercury (Hg)	0,02	

(v) Coatings, laminates and membranes Applicability: Where incorporated into textile structure	Polymers shall not contain the following phthalates: DEHP (Bis-(2-ethylhexyl)-phthalate) BBP (Butylbenzylphthalate) DBP (Dibutylphthalate) DMEP (Bis2-methoxyethyl) phthalate DIBP (Diisobutylphthalat) DIHP (Di-C6-8-branched alkyphthalates) DHNUP (Di-C7-11-branched alkylphthalates) DHP (Di-n-hexylphthalate)	Sum total 0,10 % w/w	Verification: Declaration of non-use by polymer manufacturer supported by SDS for the plasticisers used in the formulation. Where the information is not available testing may be requested. Test method: EN ISO 14389
	Fluoropolymer membranes and laminates may be used for outdoor wear and technical outdoor clothing. They shall not be manufactured using PFOA or any of its higher homologues as defined by the OECD.		Verification: Declaration of compliance from the membrane or laminate manufacturer with respect to the polymer production.
(vi) Accessories such as buttons, rivets and zips Applicability: Where incorporated into garment structure	For metal accessories:		Verification: Testing of the composition of the metal components. Test methods: For nickel migration EN 12472-2005 EN 1811-1998+A1-2008 For other metals Detection — GC-ICP-MS
	A migration limit shall apply to nickel-containing metal alloys that are in direct and prolonged contact with the skin.	Nickel 0,5 µg/cm^2/week	
	Additionally testing shall be carried out for the presence of the following metals, to which the following limit values shall apply:		

	Lead (Pb),	90 mg/kg	
	Cadmium (Cd)		
	— products intended for babies and children under 3 years old	50 mg/kg	
	— all other products including interior textiles	100 mg/kg	
	Chrome (Cr) where there is chrome plating	60 mg/kg	
	Mercury (Hg)	60 mg/kg	
	The following phthalates shall not be used in any plastic accessories: — DEHP (Bis-(2-ethylhexyl)-phthalate) — BBP (Butylbenzylphthalate) — DBP (Dibutylphthalate) — DMEP (Bis2-methoxyethyl) phthalate — DIBP (Diisobutylphthalate) — DIHP (Di-C6-8-branched alkyphthalates) — DHNUP (Di-C7-11-branched alkylphthalates) — DHP (Di-n-hexylphthalate) The following phthalates shall not be used in children's	n/a	Verification: SDS is to be provided for the plastic formulation.

	clothing where there is a risk that the accessory may be placed in the mouth e.g. zip handles: — DINP (Di-isononyl phthalate) — DIDP (Di-isodecyl phthalate) — DNOP (Di-n-Octyl phthalate)		

([1])

Regulation (EU) No 528/2012 of the European Parliament and of the Council of 22 May 2012 concerning the making available on the market and use of biocidal products (OJ L 167, 27.6.2012, p. 1).

Subsection B.3.2: Biodegradability of auxiliaries and finishing agents for fibres and yarns

(Source: BLUE ANGEL The German Ecolabel for Textiles, DE-UZ 154, Basic Award Criteria Edition July 2017, Version 1.8, Chapter 3.2.3 -

https://produktinfo.blauer-engel.de/uploads/criteriafile/en/DE-UZ%20154-201707-en-Criteria-V1.8.pdf)

Substance group	Scope of restriction	Limit values	Compliance verification

i) Sizing preparations applied to fibres and yarns Applicability: Spinning processes	At least 95% (by dry weight) of the components are readily biodegradable. In all cases, the sum of the individual components is taken into account.	**Readily biodegradable**: 70% degradation of dissolved organic car bon within 28 days or 60% of theoretical maximum oxygen depletion or carbon dioxide generation within 28 days	Declaration from the chemical supplier supported by OECD or ISO test results Test methods: OECD 301 A, ISO 7827 OECD 301 B, ISO 9439 OECD 301 C, OECD 301 D, OECD 301 E, OECD 301 F, ISO 9408 OECD 310, ISO 14593 ISO 10708
ii) Spinning solution additives, spinning additives and preparation agents (Including carding oils, spin finishes and lubricants) Applicability: Primary spinning pro cesses	At least 90% (by dry weight) of the components are readily biodegradable, inherently biodegradable or eliminable in wastewater treatment plants. In all cases, the sum of the individual components is taken into account.	**Readily biodegradable:** See definition under i) **Inherently biodegradable:** 80% degradation of dissolved organic car bon within 7 days (possibly 28 days). **Eliminability in laboratory clarification units:** 80% degradation of dissolved organic carbon (plateau phase)	Declaration from the chemical supplier supported by OECD or ISO test results Test methods: See compliance verifications under i) readily biodegradable tests. Inherently biodegradable tests that are accepted: OECD 302 B, ISO 9888 OECD 302 C Tests for eliminability in laboratory clarification units:

			OECD 303A/B, ISO 11733

This degree of biodegradation is achieved within 10 days of the beginning of the degradation phase starting with the day when 10% of the substance has been degraded, unless the substance has been identified as a UVCB (unknown or variable compositions, complex reaction products or biological materials) or as a complex multi-constituent substance with structurally similar constituents. In this case, and when there is sufficient reason, the 10-day window are not applied, and the 28-day result is applicable instead. The economic activity provides a list of all spinning solution additives, spinning auxiliaries and preparation agents for primary spinning (including carding oils, spin finishes and lubricants) and their manufacturers. In addition, the declarations from the chemical suppliers and the corresponding test reports, or safety data sheets, indicating the tests used to investigate the substances and their results, are provided. The corresponding ISO standards and REACH methods (Regulations EC 440/2008 and EC 761/2009) are recognized as equivalent.

B.4 Use of recycled materials and sourcing of renewable feedstocks for virgin fibre production

The fibres contain either recycled content from post-consumer waste or are sourced from renewable feedstocks, or a combination of both, in line with the following requirements, amounting in total to a minimum of [70] % by weight of all the fibres in the product. In the case of polyester fibres, recycled content is coming from recycled polyester fabrics (closed-loop recycling).

- Third party verification of the recycled content and its traceability is provided for the relevant feedstocks and production lines according to ISO 14021. For recycled plastics, the verification provides information in accordance with the traceability requirements in part 4.4 of EN 15343. Verification can also be provided by using the Textile Exchange Recycled Claim Standard (RCS), the Global Recycle Standard (GRS), SCS Recycled content certification (SCS Global Services), UL Recycled Content Verification, Intertek's Green Leaf Mark or the C2C Certified™ Silver Product Standard.

- In the case of virgin man-made cellulose fibres (MMCF), feedstock is sourced from certified wood that has been grown according to the principles of sustainable forest management as defined by Food and Agriculture Organisation of the United Nations (UN FAO)[328]. Wearing apparel certified by the Forest Stewardship Council (FSC) and/or the Programme for the Endorsement of Forest Certification Schemes (PEFC International) are considered aligned with these principles.

- In the case of virgin cotton and other natural cellulosic seed fibres (including kapok), they are derived from agricultural production practices being certified as organic or in transition to organic in compliance with a standard endorsed by IFOAM Family of Standards, such as defined in Regulation (EU) 2018/848, USDA National Organic Program (NOP), APEDA's National Programme for Organic Production (NPOP), China Organic Standard GB/T19630. The Global Organic Textile Standard (GOTS), the Demeter Biodynamic Farm Standard, the Organic Content Standard (OCS) and the Regenerative Organic Certification (ROC) are also accepted. The certification body has a valid and recognised accreditation for the standard it certifies against, for example, ISO 17065, NOP or IFOAM. The remaining share of virgin cotton fibres are derived from agricultural production practices implementing Integrated Pest Management (IPM) principles as defined by the UN Food and Agricultural Organisation (FAO) IPM programme, or Integrated Crop Management (ICM) systems incorporating IPM

[328] http://www.fao.org/forestry/sfm/en/

principles. Documentation is provided that the cotton has been grown by farmers that have participated in formal training programmes of the UN FAO or Government IPM and ICM programmes and/or that have been audited as part of third party certified IPM schemes.

- In the case of the virgin synthetic fibres made of renewable feedstocks, the materials are composed of biomass from a living source that can be continually replenished, or from a source which is continually replenished by nature. All bio-based materials come from sources that are replenished at a rate equal to or greater than the rate of depletion. An internationally recognised certification is provided, such as the ISCC PLUS Certification for the Circular Economy and Bioeconomy, or the RSB Global Advanced Products Certification.

Any fibre may be used without having to meet any of the criteria on the use of recycled materials and sourcing of renewable feedstocks mentioned above if it contributes to less than 5 % of the total weight of the product or if it constitutes a padding or lining. Documentation corresponding to the quantity of fibres used in each final product is provided from the spinning and/or fabric production stages. All documentation reference the Control Body or certifier of the different forms of fibres.

C. Clothing rental and other product-as-a-service models

The economic activity provides the customer with access to wearing apparel for example through subscription, leasing or renting services. The contractual terms and conditions ensure that there is an obligation for the operator of such an economic activity to take back and for the customer to give back the used wearing apparel at the end of the contractual agreement. Records of all wearing apparel pieces that form part of the asset management system are provided to document the intensity of actual use (e.g. number of users per item and year).[329]

If the economic activity includes purchasing newly manufactured wearing apparel, it complies with the B.1 to B.4 criteria listed above.

[329] Once the European Commission has approved the Product Environmental Footprint Category Rules (PEFCR) for Apparel, a benchmark for the average lifespan of different products on the European market will be established: https://ec.europa.eu/environment/eussd/smgp/ef_transition.htm

If the economic activity is operated as an e-commerce, the shipping of garments to the customer deploys reusable transport packaging that meets the following requirements:

- The packaging is designed for reuse in the same or similar application, or for another purposeful packaging use in a supply chain.
- The packaging is highly durable to function properly in its original condition for multiple trips and its lifetime is measured in years.
- During its useful life, the packaging is repeatedly recovered, inspected, repaired if necessary, and reissued into the supply chain for reuse.
- The packaging operates in a system that prevents it from solid waste, and a process is in place for the recovery and recycling of the product at its end of life.

In case the economic activity involves laundry and dry cleaning of used wearing apparel, the criteria of the Nordic Ecolabelling for Textile services, the Blue Angel criteria for environmentally friendly alternatives to dry cleaning, or other relevant ISO type 1 Ecolabels are met.

Do no significant harm ('DNSH')

(1) Climate change mitigation	If the economic activity includes on-site generation of heat and/or power, the associated energy-related GHG emissions should be lower than 270 gCO2e/kWh.
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) …/… supplementing Regulation (EU) 2020/852.
(3) Sustainable use and protection of water and marine resources	In the case of manufacture of new wearing apparel and/or laundry of used wearing apparel, the economic activity complies with all of the following criteria: • Environmental degradation risks related to preserving water quality and avoiding water stress are identified and addressed

with the aim of achieving good water status and good ecological potential as defined in Article 2, points (22) and (23), of Regulation (EU) 2020/852, in accordance with Directive 2000/60/EC of the European Parliament and of the Council[4] and a water use and protection management plan, developed thereunder for the potentially affected water body or bodies, in consultation with relevant stakeholders.

- All water sources are classified in terms of their sensitivity, either designated as a protected area, nationally or internationally, regardless the amount of water abstracted, or recognized as 'sensitive' by a professional due to their relative size in m3. Groundwater is considered as a sensitive source per se. For each sensitive water source, it is defined if the maximum abstraction rates coincide with periods of water stress of the source. And relate the water discharge per period with water stress periods. The Water Stress Index (WSI) of a source can be measured by calculating collective water abstraction in relation to the available water per source (with the water abstraction volume per source in [m3/month or sensitive period] and [average m3/year]). Long Term Average Available (LTAA) water are available at the River Basin Committee Authorities.

- Sustainable levels of water abstraction are subject to a permit in accordance with the Directive 2000/60/EC. At company level, a dedicated water management plan is in place, and water audits are carried out at least annually to ensure that the objectives of the water management plan are met. The water management plan includes flow diagrams and a water mass balance of the plant and processes in scope of the economic activity, the establishment of water efficiency objectives, and the implementation of water optimisation techniques such as control of water usage, reuse or recycling of process water, detection and repair of leaks. The water management plan and the water audits may be integrated and documented in the overall water

	management plan of a larger industrial site (e.g. cluster of textile plants). • In addition, a stormwater management plan is in place to mitigate harmful overflows from the wastewater collection system which may include installation of separate retention tanks or a rainwater harvesting system or an equivalent. Sewage sludge is used in accordance with Council Directive 86/278/EEC or as required by national law relating to the spreading of sludge on the soil or any other application of sludge on and in the soil. Where an Environmental Impact Assessment is carried out in accordance with Directive 2011/92/EU of the European Parliament and of the Council[5] and includes an assessment of the impact on water in accordance with Directive 2000/60/EC, no additional assessment of impact on water is required, provided the risks identified have been addressed.
(5) Pollution prevention and control	If the economic activity includes the manufacture or purchasing of new wearing apparel, retreating and proofing of functional coatings, or the refurbishment of used wearing apparel, dyes and textile auxiliaries do not contain any substances which are identified as SVHC under the European Chemicals Regulation REACH (1907/2006/EC) and which have been incorporated into the list drawn up in accordance with Article 59, Paragraph 1 of the REACH Regulation (so-called "list of candidates"). If the substance is part of a mixture, its concentration must not exceed 0.10% by mass. If a stricter, more specific concentration limit is specified for a substance in a mixture in the CLP Regulation (EC/1272/2008) then this is valid. Dyes and textile auxiliaries comply with the limit values in

	Chapter 1 of the ZDHC Manufacturing Restricted Substance List (MRSL), Version 2.0.[330]
(6) Protection and restoration of biodiversity and ecosystems	An Environmental Impact Assessment (EIA) or screening[331] has been completed in accordance with Directive 2011/92/EU[332]. Where an EIA has been carried out, the required mitigation and compensation measures for protecting the environment are implemented. For sites/operations located in or near biodiversity-sensitive areas (including the Natura 2000 network of protected areas, UNESCO World Heritage sites and Key Biodiversity Areas, as well as other protected areas), an appropriate assessment[333], where applicable, has been conducted and based on its conclusions the necessary mitigation measures[334] are implemented.

[330] https://mrsl.roadmaptozero.com/

[331] The procedure through which the competent authority determines whether projects listed in Annex II to Directive 2011/92/EU is to be made subject to an environmental impact assessment (as referred to in Article 4(2) of that Directive).

[332] For activities in third countries, in accordance with equivalent applicable national law or international standards requiring the completion of an EIA or screening, for example, IFC Performance Standard 1: Assessment and Management of Environmental and Social Risks.

[333] In accordance with Directives 2009/147/EC and 92/43/EEC. For activities located in third countries, in accordance with equivalent applicable national law and international standards, that aim at the conservation of natural habitats, wild fauna and wild flora, and that require to carry out (1) a screening procedure to determine whether, for a given activity, an appropriate assessment of the possible impacts on protected habitats and species is needed; (2) such an appropriate assessment where the screening determines that it is needed, for example IFC Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources.

[334] Those measures have been identified to ensure that the project, plan or activity will not have any significant effects on the conservation objectives of the protected area.

Rationale

Description of the activity

- Due to availability of cheap raw materials, there is a lack of efforts to avoid waste more systematically along the whole value chain for wearing apparel, and to promote a longer lifetime and high-quality of the garments in use, allowing for more intense use and re-use at a broader scale.

- Worldwide, clothing utilisation – the number of times a garment is worn before it ceases to be used – has decreased by 36% compared to 15 years ago while production has doubled. On average, each clothing piece will be worn 7 times before getting thrown away. It is estimated that more than half of fast fashion produced is disposed of in under a year.[335]

- As closed-loop recycling of used wearing apparel (that is fibres recycled into similar value use) is almost non-existent today, a substantial contribution to expand circular practices in the sector has to focus on value retention over recovery, ultimately reducing resource consumption and pollution associated with the manufacturing and selling of new clothing.

Technical screening criteria SC

Transition to a circular economy – Criteria set A

- Criteria set A is directly prolonging the use of products through economic activities mentioned in TaxR Art. 13 (1e), incl. reuse, repurposing, alternation, upgrades and repair, and selling second-hand wearing apparel.

- In addition, it is promoting technologies and processes for refurbishment, ensuring that the used garments are collected and reused as high-quality inputs to bring the

[335] Ellen MacArthur Foundation, A New Textiles Economy: Redesigning fashion's future, 2017

discarded, out-dated or no longer functional wearing apparel products to a condition and performance, after which they can re-enter the market.

- These economic activities substantially contribute to the transition to a circular economy by avoiding the widespread practices of downcycling and destruction of collected used garments in the market today, in line with TaxR Art. 13 (1h/ i/ j).

- Second-hand products or refurbished goods may have imperfections and faults that are attributed to normal wear and tear. In some cases, there may be quality issues with a product due to its age and how it has been previously used. In this context, repair services offer a modest but relevant 1.35x life time extension, assuming professional repairs can reach a huge number of users of wearing apparel. (WRAP, Valuing our clothes, 2017; based on expert input from circularity experts and repair business executives)

- Selling refurbished clothing has the potential to double lifetime extension, reflecting potential brand and manufacturer collaborations around up-cycling. Recommerce models can extend average product life by 1.7x, based on average length of second-hand ownership. (Elizabeth Cline: The conscious closet, 2019). For more data and modelling see: https://www.mckinsey.com/~/media/mckinsey/industries/retail/our%20insights/fashion%20on%20climate/fashion-on-climate-full-report.pdf

Transition to a circular economy – Criteria set B

- This includes Design for durability - TaxR Art. 13 (1b/ e), Design for reuse and recyclability - TaxR Art. 13 (1b/ c), Use of chemicals - TaxR Art. 13 (1d), Choice of materials, Design with recycled input - TaxR Art. 13 (1ai/ f)

- Criteria set B is making a substantial contribution to the circular design and production of new garments by building on the environmental ambition level of existing ISO Type 1 Ecolabels and the EU voluntary criteria for Green Public Procurement where relevant, e.g. regarding durability (B1) and restrictions of hazardous chemicals (B3), building on available industry standards and schemes such as Oeko-Tex 100.

- The design for disassembly, reuse and recycling criteria (B2) are based on the recycling matrix in the Accelerating Circularity report on modelling and linking (see

on page 15):
https://static1.squarespace.com/static/5e434df1c42dd46de2822ab1/t/60884fa77c501f4f7ef8982c/1619546024941/ModelingAndLinkingReport.pdf,
the Fashion Positive Circular Materials Guidelines: https://textileexchange.org/wp-content/uploads/2020/08/Circular-Materials-Guidelines-v1.0-Final-08202020.pdf
and the industry collaboration within the Jeans Redesign Project:
https://www.ellenmacarthurfoundation.org/our-work/activities/make-fashion-circular/the-jeans-redesign

- B4 Use of recycled materials is based on data and examples from this report: https://textileexchange.org/wp-content/uploads/2020/06/Textile-Exchange_Preferred-Fiber-Material-Market-Report_2020.pdf and company examples from the Make Fashion Circular business network of the Ellen MacArthur Foundation (https://www.ellenmacarthurfoundation.org/our-work/activities/make-fashion-circular/participants)

- While in a circular economy it is encouraged that pre-consumer waste is kept in the system, e.g. by replacing virgin resources for the same process, the priority is to avoid such pre-consumer waste as part of optimising manufacturing processes in the first place, and less about substantial contribution to the circular economy. Circular economy is about transforming entire sectors to ensure material and products are kept at their highest value, e.g. through reusable packaging / recycling system connecting different steps of the value chain. Moreover, including recycling of pre-consumer waste in the recycled content calculation could create the perverse effect of incentivising the production of such industrial waste, harming the circular economy objective. Recycled content should therefore exclude pre-consumer recycled content. ISO 14021 clearly differentiates pre-consumer and post-consumer recycled content, with the former being about materials diverted from the waste stream during a manufacturing process.

- There are already 100% recycled polyester fabrics in the market today, that's why we decided that we want to raise the bar on textile-to-textile vs. the widespread PET bottle-to-textile fibre downcycling. There are GRS certified polyester products made from recycled polyester fabrics, which requires a minimum of 20% recycled content. To promote a circular economy for packaging, it is important not to distract rPET from bottles to the textile sector, but rather support closed-loop recycling for both packaging and textiles applications respectively, to maximise value retention

and reducing environmental impacts related to the manufacturing of new packaging and products.

- For cashmere, some brands are claiming 95-97% recycled content. Wool is usually blended with virgin fibres. The Cardato certification programme demands 65%. Other companies achieve more than 50% recycled content. On recycled content for cellulose fibres, there are examples ranging from 30% to 100% (https://circulo.se/faq). For mechanical recycling of post-consumer cotton into new cotton fibres, a minimum threshold today could be 10-20%, considering that best practices get to 50% as a maximum (the remainder being virgin cotton or polyester). The GRS standard requires a minimum of 20%.

- The criteria on sourcing of renewable feedstocks for fibres production are based on Fashion Positive Circular Materials Guidelines: https://textileexchange.org/wp-content/uploads/2020/08/Circular-Materials-Guidelines-v1.0-Final-08202020.pdf .

Transition to a circular economy – Criteria set C

- Criteria set C focuses on the promotion of clothing rental and other product-as-a-service models prolonging the use of products through economic activities mentioned in TaxR Art. 13 (1e), incl. through reuse, repurposing, upgrades and repair, and sharing products.

- The rental model is assumed to extend product life by 1.8x, based on the average number of rentals during a product's lifetime: https://www.mckinsey.com/~/media/mckinsey/industries/retail/our%20insights/fashion%20on%20climate/fashion-on-climate-full-report.pdf

Technical screening criteria DNSH

- Our current proposal for DNSH criteria builds on generic formulations used in the DNSH criteria in the EC delegated act on climate change mitigation and adaptation under the EU Taxonomy Regulation (EU) 2020/852.
  --> Feedback welcome on the need to develop more specific DNSH criteria for the economic activities in scope.

- In addition, we aligned the DNSH criteria for the water and pollution objectives with the criteria defined for C13.30 on Textile Finishing.

- We also highlighted the need to update the DNSH criteria on pollution and prevention as soon as industry standards become available to reduce microfiber pollution.

Additional DNSH on prevention and control of microfiber pollution

- Currently, there are no standards available that allow to define a substantial contribution of the textile industry to reduce microfiber release at this stage.

- Additional criteria on substantial contribution to prevent and control of microfiber pollution have to be formulated in the following areas: Parameters for textile design (fibre length, yarn spinning, weaving, fabric construction), Finishing treatments and dyeing processes, and industrial pre-washing of items including effective filtration systems.

Additional DNSH criteria could be developed around biodegradability

- Biodegradability refers to the ease with which fabrics are decomposed naturally through the action of microorganisms.

- Biodegradability of a fabric depends on several factors, the most critical of which is the type of raw material used. Natural raw materials such as cellulose-based fibres are naturally biodegradable. In addition to the selection of the fibre, chemicals (including dyes) used, the finishing processes and the design also have an impact on the biodegradability of a garment. For instance, multiple layers sewn together prolong the biodegradation process. Similarly, non-biodegradable accessories used in stitching, labels or buttons also hinder biodegradability of a garment.

- The presence of substances of concern such as heavy metals can inhibit bacterial growth which can interfere with the biodegradability of a garment. Selection of materials that are easily biodegradable, use of biodegradable chemicals and avoiding metal-based chemical for finishing and simplifying garment pattern making can enhance biodegradability of garments thereby reducing the impacts of textiles on the environment.

- The EU taxonomy should consider referencing future industry standards e.g. on composting garments as a safe pathway for material circulation (and soil regeneration) only, if they specify in an appropriate way (1) in what timeframe and (2) in what environment, and (3) with which degree of reliability the fabrics de-composite.

2.22 Manufacture, remanufacture and reselling of footwear and leather goods

Description of the activity

The economic activity in scope covers three types of activities:

1. Manufacturing of leather goods and footwear:

    - **Manufacture of leather wearing apparel.** The activity is classified under NACE code C14.11 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

    - **Manufacture of leather gloves and hats.** The activity is classified under NACE code C14.19 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

    - **Manufacture of luggage, handbags and the like, saddlery and harness.** The activity is classified under NACE code C15.12 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

    - **Manufacture of footwear.** The activity is classified under NACE code C15.20 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

2. Repair of footwear and leather goods:

    - **Repair of footwear and leather goods.** The activity is classified under NACE code S95.23 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

3. Sales activities, only for products manufactured in C14.11, C14.19, C15.12 and C15.20:

    - **Retail sale of footwear and leather goods in specialised stores.** The activity is classified under NACE code G47.72 in accordance with the

statistical classification of economic activities established by Regulation (EC) No 1893/2006.

- **Retail sale of second-hand goods in stores.** The activity is classified under NACE code G47.79 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

- **Retail sale via stalls and markets of textiles, clothing and footwear.** The activity is classified under NACE code G47.82 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

- **Retail sale via stalls and markets of other goods.** The activity is classified under NACE code G47.89 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

Retail sale via mail order houses or via Internet. The activity is classified under NACE code G47.91 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

Substantial contribution to transition to a circular economy

To contribute substantially the economic activity in scope has to comply with at least one of A, B and C below:

A. Resell, repair and/or refurbish used footwear and leather goods. The activity complies with at least one of the following:

- **Collection and reselling of footwear and leather goods previously used before by a customer** (household or organisation), possibly after its refurbishment and/or repair, with a minimum one-year warranty, covering repair or replacement, during which time goods are ensured to be in conformity with the contract specifications at no additional cost. For the warranty period arrangements need to be made with retailers to add no cost if manufacturers supply the part free-of-charge. Proof of collection and resale of used footwear and leather goods is provided. In case of refurbishment and/or repair, a substantial part of the leather goods' and footwear's components or parts

have been retained. Provision of a copy of the warranty terms and conditions and a declaration that they cover the conformity of the goods with the contract specifications, including all indicated usage.

- **Refurbishment and/or repair services for leather goods and footwear in use by a customer** (household or organisation), with a minimum one-year warranty covering repair or replacement, with the contract specifications at no additional cost. A substantial part of the leather goods' and footwear's components or parts have been retained. Provision of a copy of the warranty terms and conditions and a declaration that they cover the conformity of the goods with the contract specifications, including all indicated usage.

B. Design and produce new leather goods in a way that supports extended lifespan through durability, reuse, refurbish, repair and recycling. The economic activity complies with the following:

- **Durability:** ensuring durable footwear and leather goods, including minimum performance properties, wear resistance of surfaces and functional properties according to the Supplementary Material-1 section for footwear and the Supplementary Material-2 section for leather goods. Provision of proof of compliance with Blue Angel for footwear (DE UZ 155, criterion 3.13.2) EU Ecolabel Footwear criterion 7, or another internationally recognised Type 1 ecolabel with similar requirements.

- **Warranty:** a minimum of a 2-year warranty for footwear and 5-year warranty for leather goods, covering repair or replacement, during which time goods are ensured to be in conformity with the contract specifications at no additional cost. This warranty covers manufacturing faults, but should not cover inappropriate use by the consumer. Provision of description of the warranty times, what the warranty covers and how this is communicated to the customer.

- **Spare parts:** spare parts available to customers for a period of at least 4 years for footwear and 10 years for leather goods from the date of purchase of the new product. The spare part offered does not have to be identical to the original part but must be able to replace the original part and fulfil its function (including durability according).

Information about spare parts must be communicated to the customer, and spare parts have to be available to independent repair services. Within the warranty period of the product spare parts must be offered at no extra cost. The spare parts have to comply with the relevant durability criteria of the Supplementary Material-1 section and the Supplementary Material-2 section. Provision of description of parts that are important for the product's function, which spare parts are offered and how this is communicated to the customer. Compliance can be verified through compliance with Blue Angel criterion 3.15, Blue Angel for footwear (DE UZ 155, criterion 3.15 and 3.13.2), EU Ecolabel Footwear criterion 7, or another internationally recognised Type 1 ecolabel with similar requirements.

- **Design for reuse and recyclability.** The manufacturer must document that design and production methods are used that allow:
    - Disassembly and reassembly of main parts of footwear (change of footbed, disassembling and assembling of soles) and leather goods to facilitate reuse and repair
    - Separation the different materials of footwear and leather goods to facilitate recycling.

  Inseparable parts of footwear or leather goods are based on the same material to allow for a common recycling process. Information on options for disassembling/reassembling of parts of the shoe (sole, footbed) for reuse, and on separation of different material for recycling of the different materials after use are easily available e.g. on the manufacturer’s website:

    - Information on the construction of footwear and leather goods together with the bill of materials.
    - Description of options for disassembling/reassembling of parts of the shoe (sole, footbed)
    - Description of how to separate the different materials after use, including their recycling options

- **Restriction of hazardous chemicals.** All components of footwear and leather goods that account for ≥ 3% by mass of the end product, and all materials that could possibly come into contact with the skin must not contain any of the following substances (RSL):

a) Substances which are identified as particularly hazardous under the European Chemicals Regulation REACH (1907/2006/EC) and which have been incorporated into the list drawn up in accordance with Article 59, Paragraph 1 of the REACH Regulation (so-called "list of candidates"). The version of the list of candidates at the time of application is valid.
b) If applicable, leather must comply with the limit values in the CADS list. The version that is valid one year before the application is valid. http://www.cads-shoes.com/.
c) Substances which according to the criteria of Regulation (EC) No 1272/200820 are assigned the following H Phrases named in the Supplementary Material-3 section or which meet the criteria for such classification must not exceed a concentration of 0.10% by mass.

The following are exempt from regulations a) and c): Impurities in concentrations that are not specified in the safety data sheet. The components listed in the safety data sheet must correspond with the regulations according to Annex II, No. 3, of the REACH regulation (EC/1907/2006). If the substance in this case is part of a preparation (a mixture) then its concentration may not exceed the general generic cut-off values according to the CLP Regulation (EC/1272/2008). If a stricter, more specific concentration limit is specified for a substance in a mixture then this is valid.

The following shall be exempt from regulation c): Monomers or additives that turn into polymers during the manufacture of plastics or are chemically (covalently) bound to the plastic if their residual concentrations are below the classification thresholds for mixtures.

The following requirements for specific substances also apply to the manufacturing process:

- Textiles: Dyes and textile auxiliaries must comply with the limit values in Chapter 1 of the ZDHC MRSL.
- In addition to the limit values in the CADS list, leather can also comply with the limit values in ZDHC MRSL, Chapter 2.

The manufacturer must submit confirmation from their suppliers verifying compliance with the requirements and submit the relevant safety data sheets. For the exempted substances and mixtures listed in the Supplementary Material-4 section, the

manufacturer shall submit verifications that all exemption conditions have been met. Footwear certified by the German Blue Angel Ecolabel (DE-UZ 155) is considered to be compliant. Footwear certified by the EU Ecolabel (2016/1349/EU) is considered to be compliant if the manufacturer provides a declaration of compliance with the ZDHC MRSL and CADS list for leather additionally.

The manufacturer has to proof that the products comply with additional special requirements for specific substances listed in the Supplementary Material-5 section. Footwear certified by the EU Ecolabel (2016/1349/EU) or the German Blue Angel Ecolabel (DE-UZ 155) are considered to be compliant.

- **VOC emissions.** Total emissions of volatile organic compounds (VOC) in the sense of Chapter V of the IED (EU Industrial Emissions Directive) during the final production process for the shoes must not exceed an average of 18.0 g VOC/pair. In the case of shoes that are classified as personal protective equipment in accordance with the Personal Protection Equipment (PPE) Regulation (EU) 2016/425, the total use of VOCs during the final production process for the shoes must not exceed an average of 20.0 g VOC/pair.

  The manufacturer shall submit a calculation for the VOC emissions during the final production process for the shoes. The calculation shall be carried out in accordance with Chapter V of the IED. Further information on this calculation process can be found in DIN EN 14602. The shoe manufacturer shall state the reduction process used. If relevant, the applicant shall submit a certificate from an accredited certification body as defined in Regulation 2016/425 verifying that the product is classified as personal protective equipment. Footwear certified by the EU Ecolabel (2016/1349/EU) or the German Blue Angel Ecolabel (DE-UZ 155) are considered to be compliant.

- **Packaging:** The material used for the final packaging of footwear or leather good shall be made of at least 80 % recycled material. Provision of a declaration of compliance specifying the material composition of the packaging and the shares of recycled and virgin material.

- **Water Consumption**: The economic activity uses process integrated techniques to reduce water consumption, such as use of short floats, reuse and recycling of treated process and wastewater. Water consumption for tanning from raw hides and skins to

finished leather is limited to 25 m3/t for cattle, 45 m3/t for calf and goat skins, 70 m³/t for pigskins, 180 l/skin for sheepskins.

The water consumption levels are referring to the entire tanning process. If intermediate products are processed (e.g. wet blue), water consumption figures for the production of the intermediate product are requested from the suppliers. Monitoring results for water consumption including the annual production volumes and the water consumption, including direct measurements, calculations or recording, using suitable meters or invoices, are provided.

- **Leather tanning**: Tanning of leather from cattle, calf, goat skins and sheep skins for footwear certified by the German Blue Angel Ecolabel (DE-UZ 155) is considered to be compliant. Tanning of leather from calf, goat skins and sheep skins for footwear certified by the EU Ecolabel (2016/1349/EU) is also considered to be compliant.

C. Design and implement a business model that extends lifespan in practice. The economic activity complies with the following:

- **The business model provides the customer with access to and use of the leather good(s)**, while ensuring the ownership remains with the manufacturer or with an alternative company providing such a service (e.g. a specialist or a retailer). The footwear or leather good is offered as a service through, e.g. subscription or renting models. A copy of the contract used for the economic activity showing that the customer pays for use of the leather good, the manufacturer or alternative company remains owner of the piece of furniture, and the manufacturer or alternative company is obliged to take back the footwear or leather items after the contract period.

- **The business model leads to extended lifespan in practice.** Evidence is provided showing that leather goods and footwear offered through this business model have a lifespan of at least twice the EU average for that product category.

Packaging: The material used for the final packaging of footwear or leather good shall be made of at least 80 % recycled material. Provision of a declaration of compliance specifying the material composition of the packaging and the shares of recycled and virgin material

Do no significant harm ('DNSH')

(1) Climate change mitigation	If the activity uses on-site generation of heat/cool and/or power, the direct GHG emissions of that activity are lower than 270 gCO2e/kWh.
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.
(3) Sustainable use and protection of water and marine resources	In case of the (re-) manufacturing of leather goods and footwear, the economic activity complies with all of the following criteria: • Environmental degradation risks related to preserving water quality and avoiding water stress are identified and addressed with the aim of achieving good water status and good ecological potential as defined in Article 2, points (22) and (23), of Regulation (EU) 2020/852, in accordance with Directive 2000/60/EC of the European Parliament and of the Council[4] and a water use and protection management plan, developed thereunder for the potentially affected water body or bodies, in consultation with relevant stakeholders. • All water sources are classified in terms of their sensitivity, either designated as a protected area, nationally or internationally, regardless the amount of water abstracted, or recognized as 'sensitive' by a professional due to their relative size in m3. Groundwater is considered as a sensitive source per se. For each sensitive water source, it is defined if the maximum abstraction rates coincide with periods of water stress of the source. And relate the water discharge per period with water stress periods.

The Water Stress Index (WSI) of a source can be measured by calculating collective water abstraction in relation to the available water per source (with the water abstraction volume per source in [m3/month or sensitive period] and [average m3/year]). Long Term Average Available (LTAA) water are available at the River Basin Committee Authorities.

- Sustainable levels of water abstraction are subject to a permit in accordance with the Directive 2000/60/EC. At company level, a dedicated water management plan is in place, and water audits are carried out at least annually to ensure that the objectives of the water management plan are met. The water management plan includes flow diagrams and a water mass balance of the plant and processes in scope of the economic activity, the establishment of water efficiency objectives, and the implementation of water optimisation techniques such as control of water usage, reuse or recycling of process water, detection and repair of leaks. The water management plan and the water audits may be integrated and documented in the overall water management plan of a larger industrial site.

- In addition, a stormwater management plan is in place to mitigate harmful overflows from the wastewater collection system which may include installation of separate retention tanks or a rainwater harvesting system or an equivalent. Sewage sludge is used in accordance with Council Directive 86/278/EEC or as required by national law relating to the spreading of sludge on the soil or any other application of sludge on and in the soil.

Where an Environmental Impact Assessment is carried out in accordance with Directive 2011/92/EU of the European Parliament and of the Council[5] and includes an assessment of the impact on water in accordance with Directive 2000/60/EC, no additional assessment of impact on water is required, provided the risks identified have been addressed.

(5) Pollution prevention and control	DNSH as set out in Appending C of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.
(6) Protection and restoration of biodiversity and ecosystems	An Environmental Impact Assessment (EIA) or screening[336] has been completed in accordance with Directive 2011/92/EU[337]. Where an EIA has been carried out, the required mitigation and compensation measures for protecting the environment are implemented. For sites/operations located in or near biodiversity-sensitive areas (including the Natura 2000 network of protected areas, UNESCO World Heritage sites and Key Biodiversity Areas, as well as other protected areas), an appropriate assessment[338], where applicable, has been conducted and based on its conclusions the necessary mitigation measures[339] are implemented. The activity does not use any hides and skins included in Appendices I-III of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (Washington Convention).

[336] The procedure through which the competent authority determines whether projects listed in Annex II to Directive 2011/92/EU is to be made subject to an environmental impact assessment (as referred to in Article 4(2) of that Directive).

[337] For activities in third countries, in accordance with equivalent applicable national law or international standards requiring the completion of an EIA or screening, for example, IFC Performance Standard 1: Assessment and Management of Environmental and Social Risks.

[338] In accordance with Directives 2009/147/EC and 92/43/EEC. For activities located in third countries, in accordance with equivalent applicable national law and international standards, that aim at the conservation of natural habitats, wild fauna and wild flora, and that require to carry out (1) a screening procedure to determine whether, for a given activity, an appropriate assessment of the possible impacts on protected habitats and species is needed; (2) such an appropriate assessment where the screening determines that it is needed, for example IFC Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources.

[339] Those measures have been identified to ensure that the project, plan or activity will not have any significant effects on the conservation objectives of the protected area.

	The activity complies with EU 2018/2001 (RED II directive) for tanning agents based on trees is required.

Supplementary Material-1 Section: **Durability criteria for footwear.** (Source: German Blue Angel Ecolabel - Basic Award Criteria for Footwear DE-UZ 155 - Edition July 2018)

	General sports	School fottwear	Casual	Men's town	Cold weather footwear	Women's town	Fashion	Infants	Indoor
Uppers' flex resistant:: (kc = without visible damage; 100 = 100 000x) (DIN EN ISO 17694)	Dry = 100 Wet = 20	Dry = 100 Wet = 20	Dry = 80 Wet = 20	Dry = 80 Wet = 20	Dry = 100 Wet = 20 – 20° = 30	Dry = 50 Wet = 10	Dry = 15	Dry = 15	Dry = 15
Uppers' tear strength: (Average tear force, N) Leather Other materials (DIN EN 13571)	≥ 80 ≥ 40	≥ 60 ≥ 40	≥ 60 ≥ 40	≥ 60 ≥ 40	≥ 60 ≥ 40	≥ 40 ≥ 40	≥ 30 ≥ 30	≥ 30 ≥ 30	≥ 30 ≥ 30
Outsoles' abrasion resistance: Cut growth (mm) Nsc = no spontaneous crack (DIN EN ISO 17707)	≤ 6 Nsc	≤ 6 Nsc	≤ 6 Nsc	≤ 6 Nsc	≤ 6 Nsc at – 10 °C	≤ 6 Nsc			
Outsoles' abrasion resistance: D ≥ 0,9 g/cm³ (mm³) D < 0,9 g/cm³ (mg) (DIN EN 12770)	≤ 200 ≤ 150	≤ 200 ≤ 150	≤ 250 ≤ 170	≤ 350 ≤ 200	≤ 200 ≤ 150	≤ 400 ≤ 250			≤ 450 ≤ 300
Upper-sole adhesion: (N/mm) (DIN EN ISO 17708)	≥ 3,0	≥ 3,0	≥ 3,0	≥ 3,0	≥ 3,0	≥ 3,0	≥ 2,5	≥ 3,0	≥ 2,5
Outsoles' tear strength: (Average strength, N/mm) D ≥ 0,9 g/cm³ D < 0,9 g/cm³ (DIN EN 12771)	 8 6	 8 6	 8 6	 6 4	 8 6	 6 4	 5 4	 6 5	 5 4
Colour fastness of the inside of the footwear (lining or inner face of the upper). Grey scale on the felt after 50 cycles wet/ (DIN EN ISO 17700)	≥ 2/3	≥ 2/3	≥ 2/3	≥ 2/3	≥ 2/3	≥ 2/3		≥ 2/3	≥ 2/3
Linings' and socks' abrasion cycles (DIN EN ISO 17704)	51.200x Dry, 12.800x Wet	51.200x Dry, 12.800x Wet	51.200x Dry, 12.800x Wet	51.200x Dry, 12.800x Wet	51.200x Dry, 12.800x Wet	51.200x Dry, 12.800x Wet			

Supplementary Material-2 section: **Durability criteria for leather goods.** (Footwear criteria in Supplementary Material to be adapted)

Supplementary Material-3 section: **H-Phrases according to Regulation (EC) No. 1272/2008 (CLP Regulation).** (*Source*: German Blue Angel Ecolabel - Basic Award Criteria for Textiles DE-UZ 155 - Edition July 2018)

Regulation (EC) No. 1272/2008 (CLP Regulation)	**Wording**
Toxic substances	
H300	Fatal if swallowed
H301	Toxic if swallowed
H304	May be fatal if swallowed and enters airways
H310	Fatal in contact with skin

H311	Toxic in contact with skin
H330	Fatal if inhaled
H331	Toxic if inhaled
H370	Causes damage to organs
H371	May cause damage to organs
H372	Causes damage to organs through prolonged or repeated exposure
H373	May cause damage to organs through prolonged or repeated exposure
Carcinogenic, mutagenic and reprotoxic substances	
H340	May cause genetic defects
H341	Suspected of causing genetic defects
H350	May cause cancer
H350i	May cause cancer if inhaled
H35127	Suspected of causing cancer
H360F	May damage fertility
H360D	May damage the unborn child
H360FD	May damage fertility May damage the unborn child
H360Fd	May damage fertility Suspected of damaging the unborn child
H360Df	May damage the unborn child Suspected of damaging fertility

H361f	Suspected of damaging fertility
H361d	Suspected of damaging the unborn child
H361fd	Suspected of damaging fertility Suspected of damaging the unborn child
H362	May cause harm to breast fed children
Water-hazardous substances	
H400	Very toxic to aquatic life
H410	Very toxic to aquatic life with long-lasting effects
H411	Toxic to aquatic life with long-lasting effects
Sensitizing substances	
H317	May cause an allergic skin reaction

Supplementary Material-4 section: **Derogated hazard classifications by substance group, including derogation conditions.** (Source: German Blue Angel Ecolabel - Basic Award Criteria for Textiles DE-UZ 155 - Edition July 2018)

[following tables have to be combined]

Substances and mixtures	Scope of validity for the exemption	Exemption conditions	Use on the shoes
Nickel	H317, H351, H372	Nickel can only be contained in stainless steel. A nickel release rate from the stainless steel must be less than or equal to the value specified in Chapter 3.5.2 of the directory of substances for limited use or 0.28 µg/cm²/week.	Toe caps and accessories for shoes that are made of metal
Dyes for dyeing and non-pigment printing	H301, H311, H331, H334, H317	Dye houses and printers must use dust free dye formulations or automatic dosing and dispensing of dyes to minimise worker exposure.	Dyes
Dyes for dyeing and non-pigment printing	H411,	Dyeing processes using reactive, direct, vat and sulphur dyes with these classifications must meet at least one of the following conditions: a) Use of high affinity dyes; b) Achievement of a reject rate of less than 3.0 %; c) Use of colour matching instrumentation; d) Use of standard operating procedures for the dyeing process; e) The dye is removed in the waste water treatment. f) g) Solution dyes and/or digital printing are excluded from these conditions.	Dyes

Substances and mixtures	Scope of validity for the exemption	Exemption conditions
Dyes for tanning leather	H317, H411	Dyes must be held in the leather to a good level (resistance to perspiration of at least 3), removal of the dyes in waste water treatment

Auxiliaries including: carriers, fastness Enhancers, levelling agents, dispersing agents, surfactants, thickeners, bonding agents, retanning agents	H301, H311, H331, H361, H371,H 372, H373, H317 (1B), H411,	The recipes must be formulated using automatic metering systems and the process must follow standard operating procedures. Substances classified with H311, H331, H317 (1B) must not be present at concentrations greater than 1.0 % by mass on any homogeneous material or article that forms part of the end product.
Reactive tanning agents	H301, H330, H317, H334, H361, H410	Use in compliance with the workplace limits, the dye must have completely reacted and must no longer be detectable in the end product.
Sodium sulphide, sodium hydrosulphide, organic mercaptans and thioacids	H301, H311, H400	Use in compliance with the workplace limits for hydrogen sulphide and mercaptans, as well as the waste water limits for sulphide
Binding agent for finishers	H317, H334	The substance must have completely reacted

Supplementary Material-5 section: Specific requirements on the final product based on EU Ecolabel (2016/1349/EU) Criterion 5 (Hazardous substances in the product and shoe components) & 6 (Restricted Substances List)

[Specific requirements will be added here concerning]

- *biocides*

- *Cr VI*
- *Total contents of heavy metals in leather, natural rubber and plastics*
- *Nickel and its compounds*
- *Extractable heavy metals in leather and textiles*
- *Organotin compounds in leather and plastic coatings, plastics and textile materials*
- *Formaldehyde in leather and textiles*
- *Use of dyes in leather, textiles and plastics*
- *Phthalates and plasticizers in plastics, natural rubber and coatings or printings of materials*
- *Polycyclic aromatic hydrocarbons (PAHs) in plastics, textiles, rubber and leather coatings*
- *N-nitrosamines in rubber*
- *Dimethylformamide in artificial leather and polymer coatings*
- *Acetophenone and phenylpropanol in ethylene vinyl acetate (EVA)*
- *Chlorinated paraffins (chloroalkanes) in leather, artificial rubber, plastics, textiles and coatings*
- *Chlorinated benzenes and toluenes in textiles made from man-made fibres and PU coatings free of DMF*
- *Alkylphenol ethoxylates and alkylphenols for leather, textiles and plastics*
- *Perfluorinated and polyfluorinated chemicals*
- *Flame retardant materials*
- *Use of nanomaterials*
- *Fragrances*

[The requirements would include ban of certain substances or limit values in the final product]

Rationale

Inclusion of C14.11, C14.19, C15.12, and C15.20. While leather is a durable material, leather goods are mostly part of a linear take-make-waste system. For example, worldwide around 20 billion pairs of shoes are produced yearly, with only 5% of these shoes being recycled. Leather goods, like luggage or handbags can consist of more than 20 different types of material, which hampers recyclability of the products. The selected manufacturing activities can substantially contribute to the circular economy by designing and producing footwear and leather goods to support the circular economy (design for durability and to be refurbished/repaired).

Inclusion of S95.23. Repair and refurbishment are key circular strategies for value retention, ensuring products and materials are kept in the economy. Including these economic activities will enable extended lifespan of leather products and footwear.

Inclusion of G47.72, G47.79, G47.82, G47.89, and G47.91. Circular business models can extend lifespan of new and existing furniture, and so substantially contribute to the circular economy. So given the importance of reuse and new circular business models, retail sale of new and second-hand leather goods and footwear has been included too.

TECHNICAL SCREENING CRITERIA RATIONALE

General

- The current system is highly linear, especially for shoes, with limited collection for repair and/or reuse within Europe. Footwear and leather goods are often not designed for disassembly, whereas have to potential for longer lifespan.

- SC can be achieved in three different ways:

A. Extending lifespan of existing footwear and leather goods items through remanufacturing and reuse

B. Designing and manufacturing new footwear and leather goods to enable reuse and remanufacturing

C. Extending lifespan of new and existing footwear and leather goods through circular business models

A. Extending lifespan of existing footwear and leather goods items through remanufacturing and reuse

- Enable collection of used footwear and leather goods, TR Art 13 (e) & (g)

- Extend product lifespan directly, by collecting, reselling and repairing footwear and leather items, TR Art 13 (e) & (g)

- Reduce the use of primary materials, with a substantial part of goods' components being retained ensuring SC in this regard (aiming to close loopholes), TR Art 13 (a)

- In some EU countries, when you buy second-hand goods you can agree with the trader on a warranty period of less than 2 years. However, it must be no shorter than 1 year and should be

made clear at the time of purchase. Landed on at least 1 year to strike balance between ensuring quality of repair/reuse activity and acknowledging some second-hand goods, especially footwear, might wear off quickly.

B. Designing and manufacturing new footwear and leather goods to enable reuse and remanufacturing

- Enable lifespan extension, reuse and recycling by creating transparency on material content, TR Art 13.1. (a), (h) and (l)

- Enable extension of product lifespan through better design, TR Art 13 (b)

- Extend safe and functional lifespan of leather products by substantially reducing the content in products and materials of hazardous substances and substituting substances of very high concern in materials and products, TR Art 13.1.(d)

Note: Criteria based on EU Ecolabel for Footwear and/or Blue Angel for Footwear where relevant.

C. Extending lifespan of new and existing footwear and leather goods through circular business models

- Enable collection of used leather items, TR Art 13 (e) & (g)

- Enable extension of product lifespan through better design, TR Art 13 (b)

- Extend product lifespan directly, TR Art 13 (e) & (g). Here, additional requirement has been provided to ensure extended lifespan in practice and avoid unintended consequences (e.g. offering leather goods through a subscription model that might have skewed incentives to increase total products in use compared to linear business model and/or reduce lifespan)

2.23 Tanning of leather

Description of the activity

The tanning process converts highly putrescible raw hides or skins into durable leather, which can be used to make a wide range of products. The entire process involves a series of complex chemical reactions and mechanical processing steps, including unhairing, tanning, dyeing and finishing. The number of raw hides and hides is determined by the number of animals and the number of slaughtered animals and is primarily related to meat consumption.

The activity is classified under NACE code C 15.11, with the exemption of manufacture of composition leather and scraping, shearing, plucking, currying, tanning, bleaching and dyeing of fur skins and hides with the hair on, in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

Substantial contribution to transition to Pollution prevention and control

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The economic activity complies with all of the following four criteria below.

1. **Sourcing practices reducing pollution**

The economic activity complies with the following:

- The activity uses raw hides and skins only from animals raised for milk or meat production in order to avoid pollution for raising animals, where producing hides and skins would be the sole purpose.
- Within the EU, documentation is required in accordance with Commission Regulation (EC) 1243/2007 of 24 October 2007 amending Annex III to Regulation (EC) No 853/2004 as well as with the Commission Implementing Document (EU) 1097/2012.
- In the case of non-European raw hides and skins, a report of compliance from meatpacker's in-house monitoring system or a report from 3rd party monitoring service provider according to the traceability (incoming) requirements of the Leather Manufacturer Audit Protocol 7.0 (P7) from the Leather Working Group[340] is provided.

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[340] https://www.leatherworkinggroup.com/how-we-work/audit-protocols/leather-manufacturer-audit-protocol-7-0

2. **Safe and efficient management of water and chemicals**

The economic activity complies with one of the following:

- All industrial facilities and installations for tanning of leather in scope of the economic activity are certified in line with Regulation EC 1221/2009, which establishes the European Union eco-management and audit scheme (EMAS, or according to ISO 14001.

- Both internal documentation and external audit reports are provided that confirm that there is an environmental management system (EMS) in place that incorporates all of the following elements:

    - Commitment, leadership, and accountability of the management, including senior management, to the implementation of an effective EMS;

    - Development of an environmental policy that includes the continuous improvement of the environmental performance of all industrial facilities and installations for tanning of leather in scope of the economic activity;

    - Objectives, best practices and performance indicators in relation to the safe and efficient use of water and chemicals in the manufacturing processes;

    - Description of the relevant processes and capabilities identified and measures applied to prevent, eliminate or reduce wastewater and pollution to the largest extent possible;

    - Internal auditing and periodic, independent external auditing to assess the environmental performance and to determine whether or not the EMS conforms to planned objectives and arrangements and that it has been properly implemented, maintained and updated, including the application of sectoral benchmarking on a regular basis.

3. **Restrictions for the use of substances of very high concern (SHVC) and other critical chemicals**

The economic activity complies with all the following criteria:

- An inventory of all chemical inputs and outputs is in place. This chemicals inventory is computer-based and contains information from the Safety Data Sheets and Technical

Data Sheets, including the status of the chemicals under the EU REACH and CLP regulations. It includes information about the identity of the process chemicals as well as the quantities, location and perishability of the process chemicals procured, recovered, stored, used and returned to suppliers.

- In addition, the activity complies with all of the following criteria:

    a. Tanning agents and auxiliaries used do not contain substances which are identified as SVHC under the European Chemicals Regulation REACH (1907/2006/EC) and which have been incorporated into the list drawn up in accordance with Article 59, Paragraph 1 of the REACH Regulation (so-called "list of candidates").

    b. Tanning agents and auxiliaries comply with the limit values in Chapter 2 of the ZDHC Manufacturing Restricted Substance List (MRSL), Version 2.0.[341]

    c. No tanning agents and auxiliaries are added, which according to the criteria of Regulation (EC) No 1272/200818 are assigned the H Phrases listed in the Supplementary Material-1 section or which meet the criteria for such classification.

    d. The use of perfluorinated and polyfluorinated chemicals (PFCs) is not permitted.

    e. The following are exempt from requirements a) and c): Impurities in concentrations that are not specified in the safety data sheet. The components listed on the safety data sheet correspond with the regulations according to Annex II, No. 3, of the REACH regulation (EC/1907/2006). If the substance in this case is part of a mixture, then its concentration does not exceed the general generic cut-off values according to the CLP Regulation (EC/1272/2008), or it meets a stricter concentration limit if specified.

- A declaration of compliance with the criteria above from each leather production site and, where necessary, their chemical suppliers is provided, based on the inventory of all chemical inputs and outputs. Where substances covered in the Supplementary

[341] https://mrsl.roadmaptozero.com/

Material-2 section are derogated, these substances are identified and supporting evidence on how the derogation conditions in the Supplementary Material-2 section are met are provided.

- Tanning of leather for footwear certified by the German Blue Angel Ecolabel (DE-UZ 155) is considered to be compliant. Tanning of leather for footwear certified by the EU Ecolabel (2016/1349/EU) is considered to be compliant if a declaration of compliance with the ZDHC MRSL Version 2.0 is provided.

4. Wastewater quality and treatment

The economic activity complies with one of the following:

- The activity reduces emissions to water by optimizing the tanning processes within the scope of the economic activity and onsite wastewater treatment if required so that the direct water discharge meets the threshold levels in the Supplementary Material-3 section.

- The activity reduces emissions to water by connecting the to a Common Effluent Treatment Plant, ensuring that the threshold levels in the Supplementary Material-4 section for indirect discharge are met.

In addition, the economic activity complies with the following:

- Reports on regular monitoring of the relevant parameters in the Supplementary Material-3 or 4 section respectively by analysis of wastewater samples or online measurements to ensure compliance are provided.

If discharged to a common wastewater treatment plant, a notice of approval for the tanning plant is provided verifying that the discharge process has been approved and that the urban wastewater treatment plant meets at least the requirements of Directive 91/271/EEC.

Do no significant harm (‘DNSH’)

(1) Climate change mitigation	The direct GHG emissions for generation of heat and/or power for the leather tanning processes in scope of the economic activity are lower than 270gCO_2e/kWh.
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) …/… supplementing Regulation (EU) 2020/852.
(3) Sustainable use and protection of water and marine resources	The economic activity complies with all of the following criteria: • Environmental degradation risks related to preserving water quality and avoiding water stress are identified and addressed with the aim of achieving good water status and good ecological potential as defined in Article 2, points (22) and (23), of Regulation (EU) 2020/852, in accordance with Directive 2000/60/EC of the European Parliament and of the Council[4] and a water use and protection management plan, developed thereunder for the potentially affected water body or bodies, in consultation with relevant stakeholders. • All water sources are classified in terms of their sensitivity, either designated as a protected area, nationally or internationally, regardless the amount of water abstracted, or recognized as 'sensitive' by a professional due to their relative size in m3. Groundwater is considered as a sensitive source per se. For each sensitive water source, it is defined if the maximum abstraction rates coincide with periods of water stress of the source. And relate the water discharge per period with water stress periods. The Water Stress Index (WSI) of a source can be measured by calculating collective water abstraction in relation to the available water per source (with the water abstraction volume per source in [m3/month or sensitive period] and [average m3/year]). Long Term Average Available (LTAA) water are available at the River Basin Committee Authorities.

	• Sustainable levels of water abstraction are subject to a permit in accordance with the Directive 2000/60/EC. At company level, a dedicated water management plan is in place, and water audits are carried out at least annually to ensure that the objectives of the water management plan are met. The water management plan includes flow diagrams and a water mass balance of the plant and processes in scope of the economic activity, the establishment of water efficiency objectives, and the implementation of water optimisation techniques such as control of water usage, reuse or recycling of process water, detection and repair of leaks. The water management plan and the water audits may be integrated and documented in the overall water management plan of a larger industrial site (e.g. cluster of textile plants). • In addition, a stormwater management plan is in place to mitigate harmful overflows from the wastewater collection system which may include installation of separate retention tanks or a rainwater harvesting system or an equivalent. Sewage sludge is used in accordance with Council Directive 86/278/EEC or as required by national law relating to the spreading of sludge on the soil or any other application of sludge on and in the soil. Where an Environmental Impact Assessment is carried out in accordance with Directive 2011/92/EU of the European Parliament and of the Council[5] and includes an assessment of the impact on water in accordance with Directive 2000/60/EC, no additional assessment of impact on water is required, provided the risks identified have been addressed.
(4) Transition to a circular economy	The activity assesses availability of and adopts techniques that support: (a) reuse and use of secondary raw materials, as well as reused or recycled water and chemicals;

	(b) design for high durability, recyclability, easy disassembly and adaptability of leather products; (c) waste management that prioritises recycling over disposal, in the manufacturing process; (d) information on the traceability of substances of concern throughout the lifecycle of the leather products.
(6) Protection and restoration of biodiversity and ecosystems	An Environmental Impact Assessment (EIA) or screening[342] has been completed in accordance with Directive 2011/92/EU[343]. Where an EIA has been carried out, the required mitigation and compensation measures for protecting the environment are implemented. For sites/operations located in or near biodiversity-sensitive areas (including the Natura 2000 network of protected areas, UNESCO World Heritage sites and Key Biodiversity Areas, as well as other protected areas), an appropriate assessment[344], where applicable, has been conducted and based on its conclusions the necessary mitigation measures[345] are implemented.

[342] The procedure through which the competent authority determines whether projects listed in Annex II to Directive 2011/92/EU is to be made subject to an environmental impact assessment (as referred to in Article 4(2) of that Directive).

[343] For activities in third countries, in accordance with equivalent applicable national law or international standards requiring the completion of an EIA or screening, for example, IFC Performance Standard 1: Assessment and Management of Environmental and Social Risks.

[344] In accordance with Directives 2009/147/EC and 92/43/EEC. For activities located in third countries, in accordance with equivalent applicable national law and international standards, that aim at the conservation of natural habitats, wild fauna and wild flora, and that require to carry out (1) a screening procedure to determine whether, for a given activity, an appropriate assessment of the possible impacts on protected habitats and species is needed; (2) such an appropriate assessment where the screening determines that it is needed, for example IFC Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources.

[345] Those measures have been identified to ensure that the project, plan or activity will not have any significant effects on the conservation objectives of the protected area.

	The activity does not use any hides and skins included in Appendices I-III of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (Washington Convention). The activity complies with EU 2018/2001 (RED II directive) for tanning agents based on trees is required.

Supplementary Material-1 section: H-Phrases according to Regulation (EC) No. 1272/2008 (CLP Regulation)

(Source: German Blue Angel Ecolabel - Basic Award Criteria for Textiles DE-UZ 155 - Edition July 2018)

Regulation (EC) No. 1272/2008 (CLP Regulation)	Wording
Toxic substances	
H300	Fatal if swallowed
H301	Toxic if swallowed
H304	May be fatal if swallowed and enters airways
H310	Fatal in contact with skin
H311	Toxic in contact with skin
H330	Fatal if inhaled
H331	Toxic if inhaled
H370	Causes damage to organs
H371	May cause damage to organs
H372	Causes damage to organs through prolonged or repeated exposure
H373	May cause damage to organs through prolonged or repeated exposure
Carcinogenic, mutagenic and reprotoxic substances	
H340	May cause genetic defects
H341	Suspected of causing genetic defects
H350	May cause cancer
H350i	May cause cancer if inhaled
H35127	Suspected of causing cancer
H360F	May damage fertility
H360D	May damage the unborn child
H360FD	May damage fertility May damage the unborn child
H360Fd	May damage fertility Suspected of damaging the unborn child
H360Df	May damage the unborn child Suspected of damaging fertility
H361f	Suspected of damaging fertility
H361d	Suspected of damaging the unborn child
H361fd	Suspected of damaging fertility Suspected of damaging the unborn child
H362	May cause harm to breast fed children
Water-hazardous substances	
H400	Very toxic to aquatic life

H410	Very toxic to aquatic life with long-lasting effects
H411	Toxic to aquatic life with long-lasting effects
Sensitizing substances	
H317	May cause an allergic skin reaction

Supplementary Material-2 section: Derogated hazard classifications by substance group, including derogation conditions

(Source: German Blue Angel Ecolabel - Basic Award Criteria for Textiles DE-UZ 155 - Edition July 2018)

Substances and mixtures	Scope of validity for the exemption	Exemption conditions
Dyes for tanning leather	H317, H411	Dyes must be held in the leather to a good level (resistance to perspiration of at least 3), removal of the dyes in waste water treatment
Auxiliaries including: carriers, fastness Enhancers, levelling agents, dispersing agents, surfactants, thickeners, bonding agents, retanning agents	H301, H311, H331, H361, H371,H 372, H373, H317 (1B), H411,	The recipes must be formulated using automatic metering systems and the process must follow standard operating procedures. Substances classified with H311, H331, H317 (1B) must not be present at concentrations greater than 1.0 % by mass on any homogeneous material or article that forms part of the end product.
Reactive tanning agents	H301, H330, H317, H334, H361, H410	Use in compliance with the workplace limits, the dye must have completely reacted and must no longer be detectable in the end product.
Sodium sulphide, sodium hydrosulphide, organic mercaptans and thioacids	H301, H311, H400	Use in compliance with the workplace limits for hydrogen sulphide and mercaptans, as well as the waste water limits for sulphide
Binding agent for finishers	H317, H334	The substance must have completely reacted

Supplementary Material-3 section: Thresholds for the quality of direct water discharge (in mg/l unless otherwise noted)

Taking into account the environmental ambition levels as defined in the EU BREF Tanning of hides and skins, the ZDHC Leather Wastewater Guidelines V1. (progressive level) and data from IULTCS

Parameter	Unit	Threshold value
COD	mg/l	150
BOD_5	mg/	20
NH^4-N	mg/	10
P $_{total}$	mg/	1
TSS	mg/	35
Cr $_{total}$	mg/	0,3
Cr VI	mg/l	0,05
S^{2-}	mg/	0,5

Supplementary Material-4 section: Thresholds for the quality of indirect water discharge (in mg/l unless otherwise noted)

Taking into account the environmental ambition levels as defined in the EU BREF Tanning of hides and skins, the ZDHC Leather Wastewater Guidelines V1. (progressive level) and data from IULTCS

Parameter	Unit	Threshold value
Cr $_{total}$	mg/	0,3
Cr VI	mg/l	0,05
S^{2-}	mg/	0,5

Rationale

Description of the activity

- Animal raising leads to contamination of ground and surface water by e.g. land spreading of manure.
- If the hides and skins would come from the meat and milk industries, the impact of farming could be mostly attributed to the production of meat and milk. Environmental impacts, including water consumption and emissions to water from animal farming, where producing hides and skins would be the sole purpose, would be prevented. This might not be guaranteed by hides and skins sourced outside the EU
- This criterion supports TR Article 12.1 (a) and (c)

Technical Screening Criteria SC

Sourcing practices reducing water consumption

- Animal raising leads to contamination of ground and surface water by e.g. land spreading of manure.
- If the hides and skins would come from the meat and milk industries, the impact of farming could be mostly attributed to the production of meat and milk. Environmental impacts, including water consumption and emissions to water from animal farming, where producing hides and skins would be the sole purpose, would be prevented. This might not be guaranteed by hides and skins sourced outside the EU
- This criterion supports TR Article 12.1 (a) and (c)

Safe and efficient management of water and chemicals

- Due to the large variety of leather manufacturing processes and chemicals being used therein, it is challenging to define Technical Screening Criteria that can be applied across the sector in a generic way.
- Therefore, the proposed Technical Screening Criteria promotes a continuous improvement process through the establishment of an environmental management system as the starting point to ensure a safe and efficient use of water and chemicals during leather manufacturing.
- This approach can support measures to reduce the pressure on water resources. Additionally, less water use may translate into less use of chemicals, and hence indirectly lowering the impact of pollution load on the water bodies.
- While an EMS may be considered standard practice within the EU, it constitutes a significant contribution for the tanning of leather outside the EU.
- This criterion supports TR Article 12.1 (a) and (c)

Restrictions for the use of substances of very high concern (SHVC) and other critical chemicals

- Innovative tanning techniques can reduce the use of chemicals at source, phasing out the use of hazardous and persistent chemicals, and replacing them with available non-toxic and biodegradable chemicals.

- Criterion 2 aims to achieve a comparable ambition level as inscribed for example in the relevant criteria of the German Blue Angel scheme for Environmentally Friendly Leather[346].

- This criterion supports TR Article 12.1 (a) and (c)

Reduction of water consumption

- The implementation of innovative techniques in leather manufacturing can lead to significant reductions in water consumption.

- The thresholds given in criterion 3 are based on criteria of the EU Ecolabel and the German Blue Angel for footwear and leather and data from IULTCS. For cattle and sheep skin they are also based on BAT.

- Although the lower level of the BAT associated performance levels and from IULTCS data are lower, they were not chosen for criterion 3, as the water consumption depends to a certain degree on product specifications.

- This criterion supports TR Article 12.1 (c)

Wastewater quality and treatment

- This criterion aims to improve the quality of water discharge and/ or the use of effective wastewater treatment technologies, aiming at a comparable environmental ambition level to the ones defined in reputed industry guidelines and standards such as the ZDHC Leather Wastewater Guidelines V1.0 (progressive level) or data from IULTCS.

- A deviation from the progressive level of ZDHC Wastewater Guidelines V 1.1 is made for parameters, where the higher range of the BAT AEL is lower.

This criterion supports TR Article 12.1 (a) and (c)

Technical Screening Criteria DNSH CCM

[346] https://www.blauer-engel.de/en/products/business-municipality/leather

The current proposal builds exclusively on generic formulations used in the DNSH criteria in the EC delegated act on climate change mitigation and adaptation under the EU Taxonomy Regulation (EU) 2020/852. We would welcome any feedback on the need to develop more specific DNSH criteria for tanning of leather.

Technical Screening Criteria DNSH CCA

The current proposal builds exclusively on generic formulations used in the DNSH criteria in the EC delegated act on climate change mitigation and adaptation under the EU Taxonomy Regulation (EU) 2020/852. We would welcome any feedback on the need to develop more specific DNSH criteria for tanning of leather.

Technical Screening Criteria DNSH CE

The current proposal builds exclusively on generic formulations used in the DNSH criteria in the EC delegated act on climate change mitigation and adaptation under the EU Taxonomy Regulation (EU) 2020/852. We would welcome any feedback on the need to develop more specific DNSH criteria for tanning of leather.

Technical Screening Criteria DNSH PPC

The BAT conclusions include the relevant requirements for tanning processes which lead to a high level of protection for the environment as a whole.

Technical Screening Criteria DNSH PRBE

In addition to the generic formulations used in the DNSH criteria in the EC delegated act specific criteria for sourcing of hides and skins and tanning agents are included.

The sourcing could have a negative impact on biodiversity by trading endangered species or contributing to deforestation.

3. Energy

3.1 Environmental refurbishment of electricity generation facilities that produce electricity from hydropower

Description of the activity

The activity is linked to:

- NACE code 35.11. “Construction or operation of electricity generation facilities that produce electricity from hydropower”
- And NACE code F42.9.1 “Construction of water projects”.

Environmental Refurbishment is defined as the technical improvements or upgrades made to mitigate the environmental impacts of existing hydropower plants, which may incorporate modernisation of structures, operation modes and equipment, introduction of new technologies or devices, and/or uprating of hydropower plants.

Substantial contribution to protection and restoration of biodiversity and ecosystems

The refurbishment needs to fulfil all the following criteria:

1. An impact assessment demonstrates that:

1.1. the refurbishment does not lead to a deterioration of the Status of the Water Body where the plant is located (as defined by the Water Framework Directive, Annex V), or, if classified as a Heavily Modified Water Body, of its Ecological Potential;

1.2. the refurbishment does not compromise the achievement of good status/potential by 2027* in any of the water bodies in the same river basin district;

1.3. and the refurbishment contributes to improved status of the water body.

The impact assessment follows the standards of Article 4 of Directive 2000/60/EC, to assess all potential impacts of the refurbishment on the status of water bodies within the same river

basin and on protected habitats and species directly dependent on water, considering in particular migration corridors, free-flowing rivers or ecosystems close to undisturbed conditions. The assessment is based on recent, comprehensive and accurate data, including monitoring data on biological quality elements that are specifically sensitive to hydromorphological alterations, and on the expected status of the water body as a result of the activity. It assesses in particular the cumulated impacts of the refurbishment with other existing or planned infrastructure in the river basin.

A monitoring plan is in place to verify that the outcomes of criteria 1.1, 1.2 and 1.3 are achieved overtime.

2. An Environmental Impact Assessment (EIA) or screening of the refurbishment has been completed in accordance with and when required by Directive 2011/92/EU 334, and the required mitigation and compensation measures for protecting the environment are implemented. For refurbishment projects located in or near biodiversity-sensitive areas (including the Natura 2000 network of protected areas, UNESCO World Heritage sites and Key Biodiversity Areas, as well as other protected areas), an appropriate assessment, where applicable, has been conducted and based on its conclusions the necessary mitigation measures are implemented.

The assessments listed in criteria 1. and 2. are streamlined in accordance with the Commission guidance document (2016/C 273/01) on streamlining environmental assessments.

3. The refurbishment is conducted on hydropower plants having a capacity above 10 MW.

4. The refurbishment is conducted on hydropower plants which have been constructed earlier than the entry into force of the present delegated act. Refurbishment aiming at the conversion of barriers built or used for other purposes into hydropower plants (retrofitting), or not in use anymore at the time of the refurbishment, is not eligible.

5. The refurbishment measures listed in points 5.1 to 5.6 are the only eligible measures. The refurbishment must include measures listed in points 5.1 to 5.3 and, where relevant, measures listed in points 5.4 to 5.6, where the results of the assessments listed in criteria 1. and 2. have evidenced the presence of related pressures:

5.1. Measures to ensure upstream and downstream fish migration (such as fish passes, adapted turbines, etc.) that allow for all riverine species to migrate both ways, for a vast

majority of individuals from each species to enter the pass, for at least 85% of those who enter to exit alive and for a low mortality observed further downstream of the dam;

5.2. Measures ensuring that discharges comply with existing legal requirements on minimum ecological flows and hydropeaking;

5.3. Measures to protect and to restore rivers' natural habitat function upstream or downstream the hydropower plant contributing to water management at the river basin level, including the following measures: creation of nature-like fishways, creation of reproduction channels or off-channel habitats, restoration of the riparian zone or riverbank vegetation, and, where relevant and depending of ownership and property rights, removal of other barriers in the river basin district, starting no later than the refurbishment;

5.4. Measures to ensure sediment flow;

5.5. Measures to prevent erosion and ensure slope stability;

5.6. Measures to stop or minimise hydropower operation and discharges and allow spillway passage during migration or spawning.

All the above-mentioned measures are implemented according to the state-of-the-art developments and current best practices, and preliminary tests have validated their effectiveness. The effectiveness of those measures is monitored in the context of plant authorisation or permit setting out the conditions aimed at achieving good status or potential of the affected water body.

A sound monitoring system is in place to demonstrate net gains in freshwater species populations (in particular, migratory fish) and other relevant biological quality elements. Key monitoring results are available to the public.

*This criterion shall be revised no later than 2027, the deadline set by the Water Framework Directive to achieve good status, to consider possible higher thresholds.

Do no significant harm ('DNSH')

(1) Climate change mitigation	*This criterion is not in the scope of this call for feedback.*

(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852. The activity does not undermine the achievement of the objective set by Directive 2007/60/EC (the Floods Directive) of reduction of the adverse consequences for human health, the environment, cultural heritage and economic activity associated with floods.
(3) Sustainable use and protection of water and marine resources	The height of the hydropower dam or weir is not increased as a result of the refurbishment. The overall volume of water used is not increased as a result of the refurbishment.
(4) Transition to circular economy	N/A
(5) Pollution prevention and control	N/A

Rationale

Why the activity is included

The construction and operation of hydropower plants are not making a substantial contribution to the objective of protection and restoration of biodiversity and ecosystems because of their massive impacts on freshwater habitats and species resulting from increased river fragmentation. “The cumulative impact of a large number of river barriers in Europe is one of the leading causes of the more than 80% decline in freshwater biodiversity and the loss of 55% of monitored migratory fish populations.” Barriers used for hydropower production and flood protection are the most common barriers on European rivers. (EEA Briefing, Tracking barriers

and their impacts on European river ecosystem, 2021). Freshwater migratory fish species like salmon, trout and eel have declined by 93% in Europe, and by 76% globally since 1970, and dams are a major driver of this decline (Deinet, S., Scott-Gatty, K., Rotton (2020) The Living Planet Index (LPI) for migratory freshwater fish).

Only the environmental refurbishment of existing hydropower plants with comprehensive environmental mitigation and restoration measures, can be considered under certain conditions as making a substantial contribution to the objective of protection and restoration of biodiversity and ecosystems.

How the activity can make a contribution + summary evidence

The environmental refurbishment of existing hydropower plants can mitigate to some extent the environmental impacts of existing hydropower plants (FIT hydro project wiki; Christian Wolter; Dirk Bernotat; Jörn Gessner, Leibniz Institute for Freshwater Ecology and Inland Fisheries, Technical planning assessment of fish mortality at hydropower plants, 2020). If environmental refurbishment is sufficiently comprehensive, and includes in particular active restoration measures such as barrier removal upstream/downstream, or construction of natural bypass or reproduction channels, it can have a lower impact for biodiversity and ecosystems than the construction of new hydropower plants which, even if equipped with the latest technology, will add to the fragmentation of rivers (Jukka Jormola, Saija Koljonen, Kirsti Leinonen, Markus Tapaninen, Pekka Vähänäkki, Finnish Environment Institute SYKE, Southwest Finland ELY-Centre, International Symposium on Eco hydraulics ISE 2018, Tokyo, 19-22 August 2018 ; Roos, J.F. "Restoring Fraser River salmon". The Pacific Salmon Commission, Vancouver (1991). p.214.).

However, refurbishment only makes sense for hydropower plants that generate a significant amount of electricity, as small hydropower plants in particular are ecologically problematic (Katharina Lange et. al., Hydropower goes unchecked, June 2019 Frontiers in Ecology and the Environment 17(5):256-258) - and most likely unprofitable if they were equipped with the necessary fish protection (Puijenbroek, P. J. T. M. Van, Buijse, A. D., Kraak, Species and river specific effects of river fragmentation on European anadromous fish species, 35, 68–77, 2019).

Type of SC and reasons for this choice

The substantial contribution retained is based on reducing pressures on biodiversity compared to the likely alternative scenarios, which are the operation of ageing hydropower assets, the

renovation of the asset without improving its environmental performance, or the construction of new assets.

Approach to SC and reasons for this choice

Level of ambition and rationale:

The level of ambition chosen is to achieve a practice of hydropower operations which is not only compatible with the objectives set by the Water Framework Directive (achieving good ecological status/potential of a vast majority of water bodies by 2027, and preventing deterioration) and the Birds and Habitats Directive (DNSH), but also matches the ambition of the EU Biodiversity Strategy of restoring at least 25,000 km free-flowing rivers; restoring of ecosystems across land and sea; legally protecting 30% of the EU's land area, and ensuring no deterioration in conservation trends and status of all protected habitats and species by 2030 (substantial contribution).

Types of criteria

- Criteria 1 is an impact-based criteria referring to the achievement/maintenance of good ecological status/potential in accordance with the Water Framework Directive (1.1 and 1.2), and reflecting the need to 'positively contribute' to the status of the water body where the plant is located, in order to qualify as a substantial contribution (1.3).

- Criteria 2 refers to the Environmental Impact Assessment and the Birds and Habitats Directives, and ensures compatibility with the DNSH criteria on biodiversity set under the draft delegated act on climate mitigation (appendix D).

- Criteria 3 introduces a capacity (>10MW) threshold for eligible hydropower plants reflecting the ambition set by the EU Biodiversity Strategy and justifying the substantial contribution to objective 6. Small hydropower plants have higher environmental impacts per kWh, are located in more pristine and ecologically diverse habitats, in Europe are often built close to other plants, therefore generating cumulative effects. Also, because of their small production, dismantling those plants is a more likely alternative (for ageing plants at least) than for larger hydropower plants.

- Criteria 4 excludes the construction of new hydropower plants including on abandoned barriers or barriers used for other purposes – deemed incompatible with the EU Biodiversity Strategy commitment to free-flowing river restoration.

Criteria 5 introduces practice-based criteria defining requirements for measures aimed at restoring the natural habitat function of rivers at the river basin scale – necessary to mitigate the harmful effects of hydropower plants on habitats, in addition to mitigating the impact of plants.

3.2 Electricity generation from bioenergy for protection and restoration of biodiversity and ecosystems

Description of the activity

Operation of installations generating electricity and/or heat that produce exclusively from biomass, biogas or bioliquids.

The activity is classified under NACE codes D35.11 and D35.30 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

Substantial contribution to protection and restoration of biodiversity and ecosystems

1. The construction and/or operation of the installation complies with the following criteria:

a) An Environmental Impact Assessment (EIA) or screening[347] has been completed in accordance with Directive 2011/92/EU.[348]

[347] The procedure through which the competent authority determines whether projects listed in Annex II to Directive 2011/92/EU is to be made subject to an environmental impact assessment (as referred to in Article 4(2) of that Directive).

[348] For activities in third countries, in accordance with equivalent applicable national law or international standards requiring the completion of an EIA or screening, for example, IFC Performance Standard 1: Assessment and Management of Environmental and Social Risks.

b) Where an EIA has been carried out, the mitigation hierarchy is observed by avoiding negative biodiversity impact to the extent possible, and the required mitigation and compensation measures for protecting the environment are implemented.

c) For sites/operations located in or near biodiversity-sensitive areas (including the Natura 2000 network of protected areas, UNESCO World Heritage sites and Key Biodiversity Areas, as well as other protected areas), an appropriate assessment[349], where applicable, has been conducted and based on its conclusions the necessary mitigation measures[350] are implemented.

2. The biomass sourced for the installation meets the following criteria:

a) Biomass is not sourced from whole trees unless one of the following exceptions applies:

   a. Whole tree harvesting is required in order to increase the conservation values of a site, as detailed in subparagraph (e)ii; or

   b. Whole trees are damaged or killed by natural causes (e.g. wind damage, disease or beetle infestation) and must be removed from the site for specific management reasons relating to health and safety, fire prevention or the enhancement of conservation values, and are not fit for non-energy industrial applications.

b) Biomass is not sourced from food or feed crops as defined by Directive 2018/2001 (the recast Renewable Energy Directive) or from other crops grown primarily for the purpose of supplying biomass for energy use.

c) If biomass is sourced from a site or sites engaged in crop production as defined by NACE codes A1.1 and A1.2:

[349] In accordance with Directives 2009/147/EC and 92/43/EEC. For activities located in third countries, in accordance with equivalent applicable national law or international standards, that aim at the conservation of natural habitats, wild fauna and wild flora, and that require to carry out (1) a screening procedure to determine whether, for a given activity, an appropriate assessment of the possible impacts on protected habitats and species is needed; (2) such an appropriate assessment where the screening determines that it is needed, for example IFC Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources.

[350] Those measures have been identified to ensure that the project, plan or activity will not have any significant effects on the conservation objectives of the protected area.

a. Those sites meet the relevant Technical Screening Criteria for a substantial contribution to biodiversity under [reference to Technical Screening Criteria for contribution to biodiversity within NACE codes A1.1 and A1.2] of this regulation.

b. Locally appropriate thresholds are set for maximum removals of agricultural residues from the field Thresholds may be expressed either in absolute terms (maximum mass of material to be removed or minimum amount of material to be left in place) or relative terms (maximum percentage of material to be removed). These thresholds should be set at a level that ensures that as compared to a baseline in which there is no supply of crop residues for offsite use:

    i. removals will not result in a decrease in the diversity or abundance of species and habitats of conservation importance or concern and removals are in line with the conservation objectives of Natura 2000 and other protected sites;

    ii. removals will not lead to a reduction of soil organic matter or soil organic carbon to levels that are critical for soil fertility;

    iii. removals will not lead to increased soil erosion.

The removal thresholds set must be approved or verified by a competent national authority. The basis for the chosen threshold and the systems in place for ensuring those thresholds are observed must be documented by the biomass supplier.

d) If biomass is sourced from a site or sites engaged in silviculture, other forestry activities or logging as defined by NACE codes 2.1 and 2.2:

a. Those sites meet the Technical Screening Criteria for a substantial contribution to biodiversity under [reference to Technical Screening Criteria for contribution to biodiversity within NACE codes A2.1 and A2.2] of this regulation.

b. Coarse woody debris is not gathered for bioenergy use unless it must be removed from the site for specific management reasons relating to health and safety, fire prevention or the enhancement of conservation values, and is not fit for non-energy industrial applications

c. Locally appropriate thresholds are set at each site for maximum removals of slash. Thresholds may be expressed either in absolute terms (maximum mass of material

to be removed or minimum amount of material to be left in place) or relative terms (maximum percentage of material to be removed). These thresholds should be set at a level that ensures that as compared to a baseline in which there are no removals of slash:

i. removals will not result in a decrease in the diversity or abundance of species and habitats of conservation importance or concern;

ii. removals will not lead to a reduction of soil organic matter or soil organic carbon to levels that are critical for soil fertility;

iii. removals will not lead to increased soil erosion.

The removal thresholds set must be approved or verified by a competent national authority. The basis for the chosen threshold and the systems in place for ensuring those thresholds are observed must be documented by the biomass supplier.

d. Saw logs and veneer logs are not used for bioenergy production.

e. Tree stumps and roots are not harvested.

f. Foliage and needles are only removed if consistent with requirements for nutrient cycling and maintenance of soil carbon at the site.

e) If biomass is sourced from a site engaged in activities falling outside NACE codes A1.1, A1.2, A2.1 and A2.2, then either:

a. The biomass meets the definition of a waste or residue from an industrial process other than agriculture or forestry, as defined by Directive 2018/2001 (the recast Renewable Energy Directive).

b. The biomass is cleared from a site in order to enhance the ecological condition of a site or its conservation values, including:

i. Replacing managed tree plantations with limited species diversity with more diverse native vegetation at a site as part of rewilding.

ii. Management of vegetation such as grasslands and reedbeds where such management is required for the conservation of rare or threatened species.

iii. Clearing vegetation in order to allow wetland or peatland restoration.

c. Ongoing biomass harvesting at the site is in full compliance with the conservation objectives and measures, and is consistent with a management plan to restore or maintain the good ecological condition of the site.351

f) The biomass meets the minimum sustainability requirements for the relevant biomass type as specified in Directive 2018/2001 (the recast Renewable Energy Directive).

3. A biomass sourcing plan is established which details the installation operator's commitment to make a substantial contribution to the protection and restoration of biodiversity and ecosystems by sourcing biomass only from sites that are managed in a way that contributes to the protection and/or restoration of biodiversity and ecosystems.

The biomass sourcing plan:

a) Describes the biomass requirements of the facility.

b) For all biomass required either:

a. Commits to sourcing only biomass certified to an appropriate voluntary standard that demonstrates that the sourced biomass complies with all the requirements set under paragraph 2; or

b. Commits to sourcing only from suppliers able to demonstrate compliance for the supplied biomass with all the requirements set under paragraph 2; or

c. Identifies the sites from which biomass will be sourced at which compliance with the requirements set under paragraph 2 may be verified.

c) Where the biomass sourcing plan commits to sourcing biomass certified to a specified voluntary standard or standards, it must demonstrate that the standard(s) used are able to fully demonstrate compliance with the requirements set under paragraph 2. This may be done by reference to an appropriate independent benchmark of the standard against the paragraph 2 requirements.

351 This could include for example: harvesting of invasive plants; material removed as part of habitat management or restoration plans.

d) Where the biomass sourcing plan commits to sourcing from suppliers able to demonstrate compliance with the requirements set under paragraph 2, it must:

   a. Identify in outline the management practices that are used by suppliers to conserve, protect and/or restore biodiversity and to achieve the good condition of the site ecosystem or to protect the site ecosystem if already in good condition.

   b. Detail monitoring practices in place to identify whether appropriate management practices are being properly implemented by those suppliers.

   c. Detail contractual terms governing the relationship with suppliers from whom biomass is sourced requiring that good management practices are followed.

   d. Define measures to be taken to return to compliance with the criteria on the source of biomass in the event that it is determined that a supplier is not properly implementing stated management practices.

e) Where the biomass sourcing plan explicitly identified source sites, it must:

   a. Identify whether these sites: are engaged in crop production as defined by NACE codes A1.1 and A1.2; are engaged in silviculture, other forestry activities or logging as defined by NACE codes 2.1 and 2.2; are engaged in activities falling outside those categorisations, and:

   b. Identify in outline the management practices that are in place at each source site to conserve, protect and/or restore biodiversity and to achieve the good condition of the site ecosystem or to protect the site ecosystem if already in good condition.

   c. Detail monitoring practices in place to identify whether these management practices are being properly implemented by site operators.

   d. Detail contractual terms governing the relationship with operators of sites from which biomass is sourced requiring that good management practices are followed.

   e. Define measures to be taken to return to compliance with the criteria on the source of biomass in the event that it is determined that a site operator is not properly implementing stated management practices.

The implementation of the biomass sourcing plan is verified by an independent third party.

4. Within two years after the beginning of the activity and every 10 years thereafter, the compliance of the activity with the substantial contribution to climate change mitigation criteria and the DNSH criteria are verified by either of the following:

a) the relevant national competent authorities;

b) an independent third-party certifier, at the request of national authorities or the operator of the activity.

In order to reduce costs, audits may be performed together with any forest certification, agricultural certification, climate certification or other audit.

The independent third-party certifier may not have any conflict of interest with the owner or the funder, and may not be involved in the development or operation of the activity.

Do no significant harm ('DNSH')

(1) Climate change mitigation	The activity meets the requirements relating to sustainability, greenhouse gas emission savings and efficiency laid down in Article 29 of Directive 2018/2001.
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852.
(3) Sustainable use and protection of water and marine resources	DNSH as set out in Appending B of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852.
(4) Transition to circular economy	The activity is not likely to result in a significant reduction of sustainable supply of primary biomass suitable for the manufacturing of long-lived bio-based products with long-term circularity potential.

(5) Pollution prevention and control	For installations falling within the scope of Directive 2010/75/EU of the European Parliament and of the Council[352], emissions are within or lower than the emission levels associated with the best available techniques (BAT-AEL) ranges set out in the best available techniques (BAT) conclusions for large combustion plants[353]. No significant cross-media effects occur. For combustion plants greater than 1 MW thermal input but below the thresholds for the BAT conclusions for large combustion plants to apply, emissions are below the emission limit values set out in Annex II, part 2, to Directive (EU) 2015/2193. For plants in zones or parts of zones not complying with the air quality limit values laid down in Directive 2008/50/EC of the European Parliament and of the Council[354], results of the information exchange278 which are published by the Commission in accordance with Article 6, paragraphs 9 and 10, of Directive (EU) 2015/2193 are taken into account. For anaerobic digestion of organic material, the produced digestate is used as fertiliser or soil improver, either directly or after composting or any other treatment, and meets the requirements for fertilising materials set out in Component Material Categories (CMC) 4 and 5 in Annex II to

[352] Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control) (OJ L 334, 17.12.2010, p. 17).

[353] Implementing Decision (EU) 2017/1442.

[354] The final technology report resulting from the exchange of information with Member States, the industries concerned and non-governmental organisations contains technical information on best available technologies used in medium combustion plants to reduce their environmental impacts, and on the emission levels achievable with best available and emerging technologies and the related costs (version of [adoption date]: https://circabc.europa.eu/ui/group/06f33a94-9829-4eee-b187-21bb783a0fbf/library/9a99a632-9ba8-4cc0-9679-08d929afda59/details).

	Regulation (EU) 2019/1009 and relevant national law on fertilising products. For anaerobic digestion plants treating over 100 tonnes per day, emissions to air and water are within or lower than the emission levels associated with the best available techniques (BAT-AEL) ranges set for anaerobic treatment of waste in the best available techniques (BAT) conclusions for waste treatment[355]. No significant cross-media effects occur.

Rationale

Explanation of the choices made (Technical Screening Criteria):

- Facility siting:
    - The proposed requirements for facility siting draw from the existing DNSH criteria for biodiversity for electricity generation installations in the climate mitigation/adaptation Technical Screening Criteria. The potential biodiversity impact from the generation facility itself is much lower than for biomass sourcing (as biomass sourcing could affect much larger areas of land) and therefore it is not considered necessary to go beyond the existing DNSH criteria in this regard.
- Biomass sourcing:
    - The exclusion of the use of whole trees for bioenergy is based on the aspiration to reduce or eliminate the use of whole trees for bioenergy that is detailed in the 2030 Biodiversity Strategy. An exception is suggested for the case that removal of whole trees would be part of a process of enhancing the conservation values

[355] Commission Implementing Decision (EU) 2018/1147 of 10 August 2018 establishing best available techniques (BAT) conclusions for waste treatment, under Directive 2010/75/EU of the European Parliament and of the Council (OJ L 208, 17.8.2018, p. 38).

of a site, for instance in the case that low biodiversity monocultures of trees were to be replaced with more diverse tree plantation or to be rewilded.

- The exclusion of the use of food or feed crops for bioenergy is based on the aspiration to reduce or eliminate the use of food or feed crops for bioenergy that is detailed in the 2030 Biodiversity Strategy. The exclusion of other purpose grown crops recognises that biodiversity can be better supported by rewilding and reducing land management intensity than by expanding managed biomass production systems.

- Where biomass is to be sourced from a site engaged in crop production, the biomass should meet the Technical Screening Criteria for biodiversity set for the relevant NACE codes to the crop production activity by ST1. Additional criteria are included in relation to removal rates for agricultural residues, recognising that biomass for bioenergy may be sourced by increased residue removals whereas the ST1 criteria for crop production are focused on the primary crop products. Residues left in the field can support biodiversity along with other ecosystem services, and thus setting locally appropriate limits on removals will be important if increasing overall residue mobilisation. Requirements for setting removal thresholds for residues are developed from proposals in IEEP (2016)[356].

- Where biomass is to be sourced from a site engaged in forestry, the biomass should meet the Technical Screening Criteria for biodiversity set for relevant NACE codes by ST1. Additional criteria are suggested in relation to removal of coarse woody debris and needles/foliage and to overall removal rates for forestry residues, recognising that biomass for bioenergy may be sourced by increased residue removals whereas the ST1 criteria for forestry are focused on the primary forest products. Residues left in the forest can support biodiversity along with other ecosystem services, and thus setting locally appropriate limits on removals will be important if increasing overall residue mobilisation. The JRC report “The use of woody biomass for energy production in the EU” identifies coarse woody debris removal as a lose-lose practice for

[356] https://ieep.eu/uploads/articles/attachments/cc72ca6f-7361-4e9b-b208-3c90e8308c98/ieep_2016_sustainability_criteria_for_biofuels_post_2020.pdf

climate and biodiversity. A requirement for management of habitat features is included based on the FSC standard. Requirements for setting removal thresholds for fine woody debris are drawn from IEEP (2016).

- For cases in which the ST1 criteria would not apply, three further cases for a substantial contribution to biodiversity are identified. Firstly, the use of wastes or residues from industrial processes other than agriculture and forestry is considered to make a contribution to biodiversity by its nature by avoiding supply chains that are likely to have a negative biodiversity impact. Secondly, the use of biomass cleared from a site in the process of enhancing the biodiversity value of the site, recognising that in some cases rewilding and other conservation activities may require clearance of some existing vegetation. Thirdly, harvesting of material from a site as part of a management plan to restore or maintain good ecological condition.

- Biomass sourcing plan:
  - To complement these criteria on the sourcing of the biomass, a requirement is proposed that the electricity generation facility should have a biomass sourcing plan detailing how it will be ensured that the biomass used by the facility consistently meets the biomass sourcing requirements.

3.3 Electricity generation using solar photovoltaic technology

Description of the activity

Construction or operation of electricity generation facilities that produce electricity using solar photovoltaic (PV) technology.

The economic activities in this category could be associated with several NACE codes, in particular D35.11 [Production of electricity] and F42.22 [Construction of utility projects for electricity and telecommunications] in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

Substantial contribution to pollution prevention and control

The activity complies with all of the following criteria:

1. Acidification potential

Pending decision on the threshold level (see Rationale for details):

Threshold Options:

The life-cycle emissions of pollutants contributing to the acidification potential are lower than…

- **0.05**
- **0.15** (possible exemption: wind power does not have to demonstrate achievement of this threshold)
- **0.10**

… kg SO_2 eq per 1 MWh of electricity output to the power grid or to directly connected customers. The calculation of the acidification potential includes all pollutants relevant for the activity, in particular NO_x, SO_2 and NH_3.

2. Photochemical ozone creation potential:

The life-cycle emissions of pollutants contributing to the photochemical ozone creation potential are lower than **0.05** kg C2H2 eq per 1 MWh of electricity output to the power grid or to directly connected customers. The calculation of the photochemical ozone creation potential includes all pollutants relevant for the activity, in particular CO, NOx and relevant VOCs.

3. Eutrophication potential:

The life-cycle emissions of pollutants contributing to the photochemical ozone creation potential are lower than **0.05** kg PO43- eq per 1 MWh of electricity output to the power grid or to directly connected customers. The calculation of the eutrophication potential includes all pollutants relevant for the activity, in particular NO_x, NH_4^+, N, PO_4^{3-}, P and COD (chemical oxygen demand).

4. Particulate matter PM10:

The life-cycle emissions of PM10 are lower than **0.05** kg/per 1 MWh of electricity output to the power grid or to directly connected customers.

5. Fine particulate matter PM2.5:

The life-cycle emissions of PM10 are lower than **0.02** kg/per 1 MWh of electricity output to the power grid or to directly connected customers.

6. Activity-specific criteria:

N/A

Methodology for calculation of criterion 1. Acidification potential, 2. Photochemical ozone creation and 3. Eutrophication based on one of the following:

- Life-cycle environmental impacts are calculated using Commission Recommendation 2013/179/EU or, alternatively, using ISO 14025:2010 and ISO 14040:2006 and ISO 14044:2006. Lifecycle environmental impacts are third party verified in according with the procedure described in ISO 14044.

Do no significant harm ('DNSH')

(1) Climate change mitigation	*This criterion is not in the scope of this call for feedback.*
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.
(3) Sustainable use and protection of water and marine resources	N/A
(4) Transition to circular economy	The activity assesses availability of and, where feasible, uses equipment and components of high durability and recyclability and that are easy to dismantle and refurbish.

(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appending D of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.

Rationale

On the choice of activities (i.e. different technologies) for power generation

The selection includes **activities** for which the conducted analysis shows that they are **in principle capable of fulfilling the proposed TSC**. Depending on the pending decision which SC threshold is selected for the Acidification Potential, not for all proposed activities, evidence was found that they could fulfil the TSC; however, due the available data for life-cycle pollutant emissions are limited, so when in doubt, the activities in question were included in the proposal (e.g. power from geothermal energy).

Nevertheless, other activities (technologies) are not included in the proposal. Power generation using liquid fuels (oil) and biomass were not included because the available data range showed their performance concerning the pollution objective is, by far, insufficient to achieve with the proposed SC thresholds. Therefore it appears unrealistic that currently any aligned assets exist that could be invested in. Hence, these activities are not proposed for the taxonomy.

Both combined heat and power generation (**CHP, cogeneration**) and power generation without heat utilisation are included.

On the criteria for substantial contribution (SC)

For all power generation activities, the same **overarching thresholds for five pollution criteria** are proposed. They address the most significant air pollutant emissions resulting from these activities in the European Union at present. These five criteria cover **life-cycle** emissions, i.e. the value chain until the generated power is delivered to the grid (or to directly connected customers), which includes direct emissions during electricity generation and indirection emissions from upstream stages (fuel production and transport), construction of the power generation facilities and production of the required components.

For **some of the activities, additional criteria** are proposed, to account for environmental specificities of the activity, or to ensure that EU legal requirements, which apply to direct instead life-cycle emissions, are also fulfilled. (These were taken from the DA Climate change mitigation criteria for DNSH concerning the Pollution objective of these activities.)

The proposed **SC threshold levels** result from the analysis of life-cycle pollution data from scientific publications and recent Environmental Product Declarations (EPDs), covering power generation using different technologies.

In the available data sources, the pollutants are either reported by substance (e.g. NOx, SO2, …) or partly combined to **metrics per type of environmental impact** (e.g. the acidification potential, which covers NOx and SO2 and, depending on the methodology, some further acidifying substances which are emitted at lower levels in power generation).

The proposed criteria use the approach of grouping pollutants based on their environmental impact. This choice allows for a lower number of criteria and is already applied in the market, for example due to its application in the EPD methodology for power generation.

The methodology for splitting the emissions between the power output and the heat output, which is required because only the power output of the **CHP** plants is covered by the activities, is proposed in analogy to the Annex II of the Energy Efficiency Directive.

Rationale for choosing the proposed SC criteria and thresholds:

1. Acidification potential (kg SO2 eq per MWh)

Includes SO2 and NOx (and depending on methodology, further pollutants)

Very significant parameter because current emissions from electricity generation are very high. The proposed conversion factors are based on Hauschild & Wenzel, 1998.

Pending decision on the threshold level of Acidification potential:

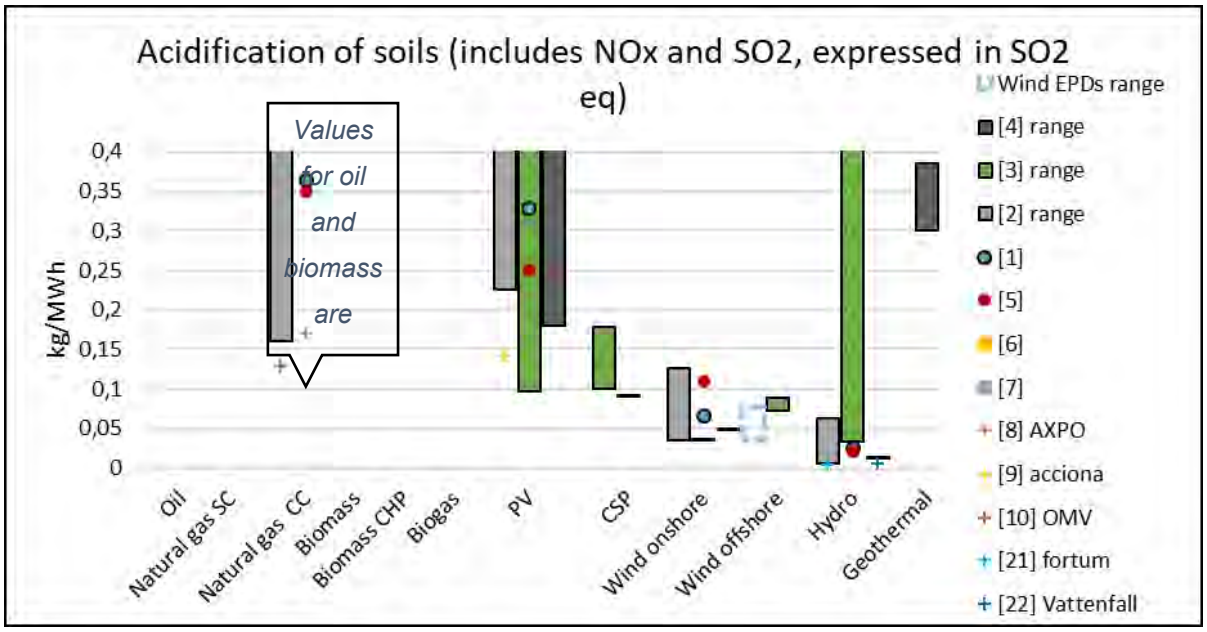
Threshold Options (all expressed in kg SO_2eq per MWh):

a) 0.05

b) 0.15

c) 0.10

The result of the data analysis is shown in the following chart, the arguments for each of the three threshold levels are presented after the chart.



[1] to [7] represent data from scientific publications (filled circles and range bars), [8]-22] represent EPDs (with [11-20] wind power EPDs shown as blue dashed range), [10] Represents NOx and SOx data from emission compliance monitoring & measurement from the power plant and internally calculated pollution data (NOx/SOx) from upstream gas field operation (based on officially reported fuel consumption for gas field operation) from the fuel provision part.

Arguments for the three threshold options:

a) 0.05

This threshold is achieved by a part of literature data (representing somewhat older data) and part of recent wind plant data as well as all recent and part of older hydropower; (currently) not achieved by PV/CSP, geothermal and natural gas.

Arguments in favour of this threshold:

- Pro:
  Evidence is robust that it is possible to generate power by wind power and hydropower at this performance level (i.e. the threshold does not represent a single best performing plant, but is achieved by a range of plants, as shown by different literature sources and recent EPDs).

- Pro:
  This is the most ambitious threshold choice. The PSFs Headline Ambition Level for the Objective “Pollution Prevention and Control” sets 2030 as the target year for preventing and eliminating pollution. Power plants and infrastructure have a long lifetime, roughly 30 – 100 years. So the current criteria proposals will cover physical infrastructure which will still be largely in operation by 2030 and thus is relevant for achieving the 2030 target. Based on the assessment carried out, it is not possible to fully prevent or eliminate pollution for power generation. However, by this threshold choice, the taxonomy highlights the strongest (currently possible) contributing performing activities to the Headline Ambition.

- Pro:
  In the area of pollution, the Green Deals is very ambitions and specifies “Zero Pollution” at the EU’s target. Likewise, the EC recently published the “Zero pollution action plan”. Therefore is appropriate to set the pollution threshold in the taxonomy, which is a voluntary and transparency instrument, to the most ambitions threshold choice.

- Pro:
  This level is achievable by wind onshore, wind offshore and hydropower, thus not limited to a single technology. (Possibly also soon achievable by PV/CSP due to rapid technology development and reduction of coal-related pollution in power generation for component production process.)

- Pro:
  To set this threshold, for which in none of the activities (technologies) every plant achieves this level, gives incentives to some activities to improve.

b) 0.15

This threshold is achieved by all of analysed wind energy data, most hydropower (all of the recent EPDs), CSP and the best PV and the best performing gas (CC gas plants).

Arguments in favour of this threshold:

- Pro:
  This level can be achieved by more technologies, e.g. best-performing gas power plants, therefore more assets included

- Pro:
  The initial Ramboll study has assessed a high improvement opportunity for the sector energy production and distribution. Identified improvement opportunities for achieving high improvement potential are related to technical and (post-)combustion modification and NOx/SOx removal processes. Having the acidification threshold set at 0.15 would give the opportunity for high performing CCGT with low pollution impact from upstream fuel provision to deliver substantial positive environmental impact on the basis of life-cycle considerations.

- Pro:
  It gives incentives for gas power plants (CCGT: combined-cycle gas turbine) and gas-fired CHP, so they reduce their pollution, in a way that they could contribute to EU objectives.

On the proposed, possible option of exempting wind power from demonstrating SC in case of the threshold level of 0.15:

At this threshold level, wind power could be exempted from proving threshold compliance, because based on the analysed data, it appears that all wind power will achieve this performance level.

c) 0.10

This threshold is achieved by all of recent wind energy (EPD) and all of recent hydropower data (EPDs, they are existing/old power plants); some CSP and some of PV (1 recent plant not), not by gas.

Arguments in favour of this threshold:

- Pro: “compromise solution” between 0.05 and 0.15.

2. Photochemical ozone creation potential: **0.05** kg C2H2 eq per MWh

The proposed threshold is achieved by geothermal, hydro (except 1 source), wind, CSP, most PV, partly by biomass, most natural gas CC.

This parameter covers in particular CO, NOx and VOCs (volatile organic compounds). VOCs are classified into the following categories: alkanes, halogenated HCs, alcohols, ketones, esters, ethers, olefins,

acetylenes, aromatics and aldehydes.

3. Eutrophication potential: **0.05** kg PO43- eq per MWh

The proposed threshold is for PV possible to achieve, achieved by most hydro, achieved by all wind and geothermal as well as CSP; partly achieved by gas CC and PV. The proposed conversion factors are based on Heijungs et al. (1992).

4. PM10: **0.05** kg/per MWh

The proposed threshold is achieved by all wind, all hydro, most gas CC, all EPDs plants.

5. PM2.5: **0.02** kg/per MWh

The proposed threshold is achieved by almost all wind, all hydro, PV most recent data, gas CC.

6. Activity-specific criteria

These parameters, which have been set for DNSH for some of these activities in the Delegated act on climate change mitigation, dealing with specific issues only relevant for certain technologies (e.g. anti-fouling paint and biocides for ocean energy technologies), or to ensure current EU legal minimum environmental performance (e.g. for direct emissions, achieving the BAT-AEL ranges where applicable), **are proposed in addition to the five common overarching SC criteria**.

In the case of power generation from natural gas, the criteria from the activity “4.7 Electricity generation from renewable non-fossil gaseous and liquid fuels” of the climate change mitigation DA were used, because they cover the same legislation that also applies to natural gas-fired power plants (BAT, Medium combustion plant directive).

Pollutants considered, but not included in proposal

Metals and metalloids (As, Cd, Pb; Hg) and PAH: would have been relevant for biomass, but power generation is not proposed as an activity for other reasons (see above); poor data availability for life-cycle emissions of these pollutants was noted.

Sources

[1] Rentizelas A, Georgakellos D. Incorporating life cycle external cost in optimization of the electricity generation mix. Energy Policy 2014;65:134–49. https://doi.org/10.1016/j.enpol.2013.10.023.

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3.4 Electricity generation using concentrated solar power (CSP) technology

Description of the activity

Construction or operation of electricity generation facilities that produce electricity using concentrated solar power (CSP) technology

The economic activities in this category could be associated with several NACE codes, in particular D35.11 [Production of electricity] and F42.22 [Construction of utility projects for electricity and telecommunications] in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006. (as in 4.2. Climate change mitigation DA)

Substantial contribution to pollution prevention and control

The activity complies with all of the following criteria:

1. Acidification potential

Pending decision on the threshold level (see Rationale for details):

Threshold Options:

The life-cycle emissions of pollutants contributing to the acidification potential are lower than…

- **0.05**
- **0.15** (possible exemption: wind power does not have to demonstrate achievement of this threshold)
- **0.10**

… kg SO_2 eq per 1 MWh of electricity output to the power grid or to directly connected customers. The calculation of the acidification potential includes all pollutants relevant for the activity, in particular NO_x, SO_2 and NH_3.

2. Photochemical ozone creation potential:

The life-cycle emissions of pollutants contributing to the photochemical ozone creation potential are lower than **0.05** kg C2H2 eq per 1 MWh of electricity output to the power grid or to directly connected customers. The calculation of the photochemical ozone creation potential includes all pollutants relevant for the activity, in particular CO, NOx and relevant VOCs.

3. Eutrophication potential:

The life-cycle emissions of pollutants contributing to the photochemical ozone creation potential are lower than **0.05** kg PO43- eq per 1 MWh of electricity output to the power grid or to directly connected customers. The calculation of the eutrophication potential includes all pollutants relevant for the activity, in particular NO_x, NH_4^+, N, PO_4^{3-}, P and COD (chemical oxygen demand).

4. Particulate matter PM10:

The life-cycle emissions of PM10 are lower than **0.05** kg/per 1 MWh of electricity output to the power grid or to directly connected customers.

5. Fine particulate matter PM2.5:

The life-cycle emissions of PM10 are lower than **0.02** kg/per 1 MWh of electricity output to the power grid or to directly connected customers.

6. Activity-specific criteria:

N/A

Methodology for calculation of criterion 1. Acidification potential, 2. Photochemical ozone creation and 3. Eutrophication based on one of the following:

- Life-cycle environmental impacts are calculated using Commission Recommendation 2013/179/EU or, alternatively, using ISO 14025:2010 and ISO 14040:2006 and ISO 14044:2006. Lifecycle environmental impacts are third party verified in according with the procedure described in ISO 14044.

Do no significant harm ('DNSH')

(1) Climate change mitigation	*This criterion is not in the scope of this call for feedback.*
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.
(3) Sustainable use and protection of water and marine resources	DNSH as set out in Appending B of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.
(4) Transition to circular economy	The activity assesses availability of and, where feasible, uses equipment and components of high durability and recyclability and that are easy to dismantle and refurbish.
(6) Protection and restoration of	DNSH as set out in Appending D of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.

biodiversity and ecosystems	

Rationale

On the choice of activities (i.e. different technologies) for power generation

The selection includes **activities** for which the conducted analysis shows that they are **in principle capable of fulfilling the proposed TSC**. Depending on the pending decision which SC threshold is selected for the Acidification Potential, not for all proposed activities, evidence was found that they could fulfil the TSC; however, due the available data for life-cycle pollutant emissions are limited, so when in doubt, the activities in question were included in the proposal (e.g. power from geothermal energy).

Nevertheless, other activities (technologies) are not included in the proposal. Power generation using liquid fuels (oil) and biomass were not included because the available data range showed their performance concerning the pollution objective is, by far, insufficient to achieve with the proposed SC thresholds. Therefore it appears unrealistic that currently any aligned assets exist that could be invested in. Hence, these activities are not proposed for the taxonomy.

Both combined heat and power generation (**CHP, cogeneration**) and power generation without heat utilisation are included.

On the criteria for substantial contribution (SC)

For all power generation activities, the same **overarching thresholds for five pollution criteria** are proposed. They address the most significant air pollutant emissions resulting from these activities in the European Union at present. These five criteria cover **life-cycle** emissions, i.e. the value chain until the generated power is delivered to the grid (or to directly connected customers), which includes direct emissions during electricity generation and indirection emissions from upstream stages (fuel production and transport), construction of the power generation facilities and production of the required components.

For **some of the activities, additional criteria** are proposed, to account for environmental specificities of the activity, or to ensure that EU legal requirements, which apply to direct

instead life-cycle emissions, are also fulfilled. (These were taken from the DA Climate change mitigation criteria for DNSH concerning the Pollution objective of these activities.)

The proposed **SC threshold levels** result from the analysis of life-cycle pollution data from scientific publications and recent Environmental Product Declarations (EPDs), covering power generation using different technologies.

In the available data sources, the pollutants are either reported by substance (e.g. NOx, SO2, …) or partly combined to **metrics per type of environmental impact** (e.g. the acidification potential, which covers NOx and SO2 and, depending on the methodology, some further acidifying substances which are emitted at lower levels in power generation).

The proposed criteria use the approach of grouping pollutants based on their environmental impact. This choice allows for a lower number of criteria and is already applied in the market, for example due to its application in the EPD methodology for power generation.

The methodology for splitting the emissions between the power output and the heat output, which is required because only the power output of the **CHP** plants is covered by the activities, is proposed in analogy to the Annex II of the Energy Efficiency Directive.

Rationale for choosing the proposed SC criteria and thresholds:

1. Acidification potential (kg SO2 eq per MWh)

Includes SO2 and NOx (and depending on methodology, further pollutants)

Very significant parameter because current emissions from electricity generation are very high. The proposed conversion factors are based on Hauschild & Wenzel, 1998.

Pending decision on the threshold level of Acidification potential:

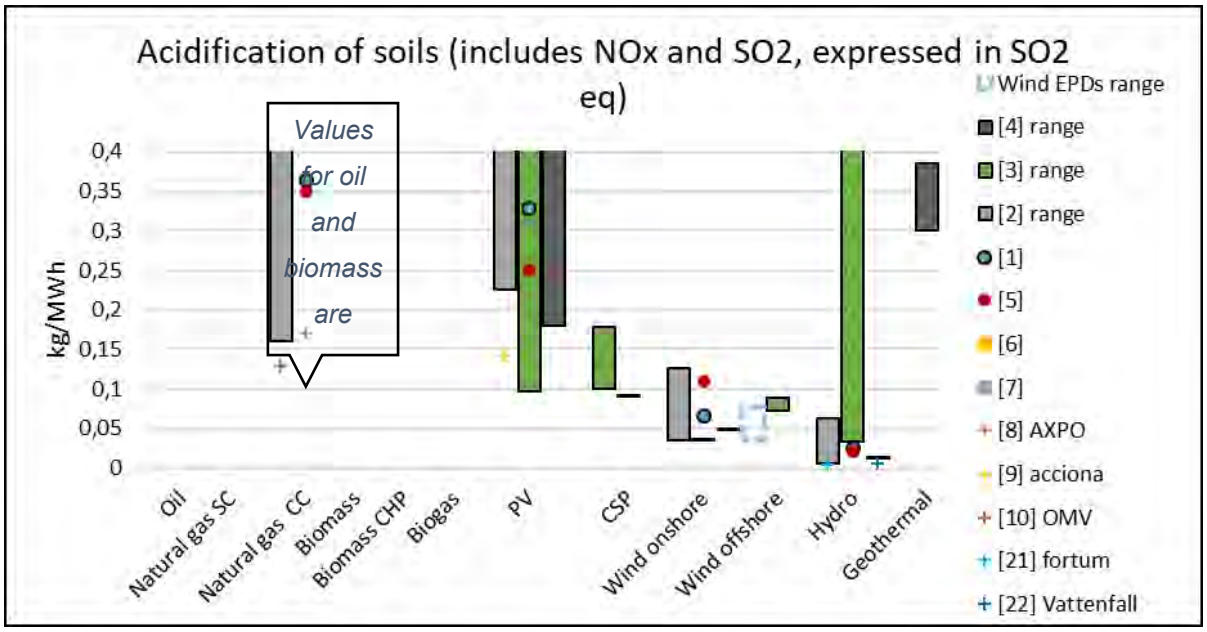
Threshold Options (all expressed in kgSO2eq per MWh):

a) 0.05

b) 0.15

c) 0.10

The result of the data analysis is shown in the following chart, the arguments for each of the three threshold levels are presented after the chart.



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Rationale for the three threshold options:

a) 0.05

This threshold is achieved by a part of literature data (representing somewhat older data) and part of recent wind plant data as well as all recent and part of older hydropower; (currently) not achieved by PV/CSP, geothermal and natural gas.

Arguments in favour of this threshold:

- Pro:
  Evidence is robust that it is possible to generate power by wind power and hydropower at this performance level (i.e. the threshold does not represent a single best performing plant, but is achieved by a range of plants, as shown by different literature sources and recent EPDs).

- Pro:
  This is the most ambitious threshold choice. The PSFs Headline Ambition Level for the Objective “Pollution Prevention and Control” sets 2030 as the target year for preventing and eliminating pollution. Power plants and infrastructure have a long lifetime, roughly 30 – 100 years. So the current criteria proposals will cover physical infrastructure which will still be largely in operation by 2030 and thus is relevant for achieving the 2030 target. Based on the assessment carried out, it is not possible to fully prevent or eliminate pollution for power generation. However, by this threshold choice, the taxonomy highlights the strongest (currently possible) contributing performing activities to the Headline Ambition.

- Pro:
  In the area of pollution, the Green Deals is very ambitions and specifies “Zero Pollution” at the EU’s target. Likewise, the EC recently published the “Zero pollution action plan”. Therefore is appropriate to set the pollution threshold in the taxonomy, which is a voluntary and transparency instrument, to the most ambitions threshold choice.

- Pro:
  This level is achievable by wind onshore, wind offshore and hydropower, thus not limited to a single technology. (Possibly also soon achievable by PV/CSP due to rapid technology development and reduction of coal-related pollution in power generation for component production process.)

- Pro:
  To set this threshold, for which in none of the activities (technologies) every plant achieves this level, gives incentives to some activities to improve.

b) 0.15

This threshold is achieved by all of analysed wind energy data, most hydropower (all of the recent EPDs), CSP and the best PV and the best performing gas (CC gas plants).

Arguments in favour of this threshold:

- Pro:
  This level can be achieved by more technologies, e.g. best-performing gas power plants, therefore more assets included

- Pro:
  The initial Ramboll study has assessed a high improvement opportunity for the sector energy production and distribution. Identified improvement opportunities for achieving high improvement potential are related to technical and (post-)combustion modification and NOx/SOx removal processes. Having the acidification threshold set at 0.15 would give the opportunity for high performing CCGT with low pollution impact from upstream fuel provision to deliver substantial positive environmental impact on the basis of life-cycle considerations.

- Pro:
  It gives incentives for gas power plants (CCGT: combined-cycle gas turbine) and gas-fired CHP, so they reduce their pollution, in a way that they could contribute to EU objectives.

On the proposed, possible option of exempting wind power from demonstrating SC in case of the threshold level of 0.15:

At this threshold level, wind power could be exempted from proving threshold compliance, because based on the analysed data, it appears that all wind power will achieve this performance level.

c) 0.10

This threshold is achieved by all of recent wind energy (EPD) and all of recent hydropower data (EPDs, they are existing/old power plants); some CSP and some of PV (1 recent plant not), not by gas.

Arguments in favour of this threshold:

- Pro: “compromise solution” between 0.05 and 0.15.

2. Photochemical ozone creation potential: **0.05** kgC2H2eq per MWh

The proposed threshold is achieved by geothermal, hydro (except 1 source), wind, CSP, most PV, partly by biomass, most natural gas CC.

This parameter covers in particular CO, NOx and VOCs (volatile organic compounds). VOCs are classified into the following categories: alkanes, halogenated HCs, alcohols, ketones, esters, ethers, olefins,

acetylenes, aromatics and aldehydes.

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The proposed threshold is for PV possible to achieve, achieved by most hydro, achieved by all wind and geothermal as well as CSP; partly achieved by gas CC and PV. The proposed conversion factors are based on Heijungs et al. (1992).

4. PM10: **0.05** kg/per MWh

The proposed threshold is achieved by all wind, all hydro, most gas CC, all EPDs plants.

5. PM2.5: **0.02** kg/per MWh

The proposed threshold is achieved by almost all wind, all hydro, PV most recent data, gas CC.

6. Activity-specific criteria

These parameters, which have been set for DNSH for some of these activities in the Delegated act on climate change mitigation, dealing with specific issues only relevant for certain technologies (e.g. anti-fouling paint and biocides for ocean energy technologies), or to ensure current EU legal minimum environmental performance (e.g. for direct emissions, achieving the BAT-AEL ranges where applicable), **are proposed in addition to the five common overarching SC criteria**.

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Pollutants considered, but not included in proposal

Metals and metalloids (As, Cd, Pb; Hg) and PAH: would have been relevant for biomass, but power generation is not proposed as an activity for other reasons (see above); poor data availability for life-cycle emissions of these pollutants was noted.

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3.5 Electricity generation from wind power

Description of the activity

Construction or operation of electricity generation facilities that produce electricity from wind power. (as in 4.3 Climate change mitigation DA, but DA reference to activity as an "integral element of the 'Installation, maintenance and repair of renewable energy technologies'" deleted)

The economic activities in this category could be associated with several NACE codes, in particular D35.11 [Production of electricity] and F42.22 [Construction of utility projects for electricity and telecommunications] in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006. (as in Climate change mitigation DA)

Substantial contribution to pollution prevention and control

The activity complies with all of the following criteria:

1. Acidification potential

Pending decision on the threshold level (see Rationale for details):

Threshold Options:

The life-cycle emissions of pollutants contributing to the acidification potential are lower than…

- **0.05**
- **0.15** (possible exemption: wind power does not have to demonstrate achievement of this threshold)
- **0.10**

… kg SO_2 eq per 1 MWh of electricity output to the power grid or to directly connected customers. The calculation of the acidification potential includes all pollutants relevant for the activity, in particular NO_x, SO_2 and NH_3.

2. Photochemical ozone creation potential:

The life-cycle emissions of pollutants contributing to the photochemical ozone creation potential are lower than **0.05** kg C2H2 eq per 1 MWh of electricity output to the power grid or to directly connected customers. The calculation of the photochemical ozone creation potential includes all pollutants relevant for the activity, in particular CO, NOx and relevant VOCs.

3. Eutrophication potential:

The life-cycle emissions of pollutants contributing to the photochemical ozone creation potential are lower than **0.05** kg PO43- eq per 1 MWh of electricity output to the power grid or to directly connected customers. The calculation of the eutrophication potential includes all pollutants relevant for the activity, in particular NO_x, NH_4^+, N, PO_4^{3-}, P and COD (chemical oxygen demand).

4. Particulate matter PM10:

The life-cycle emissions of PM10 are lower than **0.05** kg/per 1 MWh of electricity output to the power grid or to directly connected customers.

5. Fine particulate matter PM2.5:

The life-cycle emissions of PM10 are lower than **0.02** kg/per 1 MWh of electricity output to the power grid or to directly connected customers.

6. Activity-specific criteria:

N/A

Methodology for calculation of criterion 1. Acidification potential, 2. Photochemical ozone creation and 3. Eutrophication based on one of the following:

- Life-cycle environmental impacts are calculated using Commission Recommendation 2013/179/EU or, alternatively, using ISO 14025:2010 and ISO 14040:2006 and ISO 14044:2006. Lifecycle environmental impacts are third party verified in according with the procedure described in ISO 14044.

Do no significant harm ('DNSH')

(1) Climate change mitigation	*This criterion is not in the scope of this call for feedback.*
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.
(3) Sustainable use and protection of water and marine resources	In case of construction of offshore wind, the activity does not hamper the achievement of good environmental status as set out in Directive 2008/56/EC of the European Parliament and of the Council, requiring that the appropriate measures are taken to prevent or mitigate impacts in relation to that Directive's Descriptor 11 (Noise/Energy), laid down in Annex I to that Directive, and as set out in Commission Decision (EU) 2017/848159 in relation to the relevant criteria and methodological standards for that descriptor.
(4) Transition to circular economy	The activity assesses availability of and, where feasible, uses equipment and components of high durability and recyclability and that are easy to dismantle and refurbish.

(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appending D of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852. In case of offshore wind, the activity does not hamper the achievement of good environmental status as set out in Directive 2008/56/EC, requiring that the appropriate measures are taken to prevent or mitigate impacts in relation to that Directive's Descriptors 1 (biodiversity) and 6 (seabed integrity), laid down in Annex I to that Directive, and as set out in Decision (EU) 2017/848 in relation to the relevant criteria and methodological standards for those descriptors[357].

Rationale

On the choice of activities (i.e. different technologies) for power generation

The selection includes **activities** for which the conducted analysis shows that they are **in principle capable of fulfilling the proposed TSC**. Depending on the pending decision which SC threshold is selected for the Acidification Potential, not for all proposed activities, evidence was found that they could fulfil the TSC; however, due the available data for life-cycle pollutant emissions are limited, so when in doubt, the activities in question were included in the proposal (e.g. power from geothermal energy).

Nevertheless, other activities (technologies) are not included in the proposal. Power generation using liquid fuels (oil) and biomass were not included because the available data range showed their performance concerning the pollution objective is, by far, insufficient to achieve with the proposed SC thresholds. Therefore it appears unrealistic that currently any aligned assets exist that could be invested in. Hence, these activities are not proposed for the taxonomy.

[357] Practical guidance for the implementation of this criterion is contained in the European Commission notice C(2020) 7730 final "Guidance document on wind energy developments and EU nature legislation", (version of [adoption date]: https://ec.europa.eu/environment/nature/natura2000/management/docs/wind_farms_en.pdf).

Both combined heat and power generation (**CHP, cogeneration**) and power generation without heat utilisation are included.

On the criteria for substantial contribution (SC)

For all power generation activities, the same **overarching thresholds for five pollution criteria** are proposed. They address the most significant air pollutant emissions resulting from these activities in the European Union at present. These five criteria cover **life-cycle** emissions, i.e. the value chain until the generated power is delivered to the grid (or to directly connected customers), which includes direct emissions during electricity generation and indirection emissions from upstream stages (fuel production and transport), construction of the power generation facilities and production of the required components.

For **some of the activities, additional criteria** are proposed, to account for environmental specificities of the activity, or to ensure that EU legal requirements, which apply to direct instead life-cycle emissions, are also fulfilled. (These were taken from the DA Climate change mitigation criteria for DNSH concerning the Pollution objective of these activities.)

The proposed **SC threshold levels** result from the analysis of life-cycle pollution data from scientific publications and recent Environmental Product Declarations (EPDs), covering power generation using different technologies.

In the available data sources, the pollutants are either reported by substance (e.g. NOx, SO2, …) or partly combined to **metrics per type of environmental impact** (e.g. the acidification potential, which covers NOx and SO2 and, depending on the methodology, some further acidifying substances which are emitted at lower levels in power generation).

The proposed criteria use the approach of grouping pollutants based on their environmental impact. This choice allows for a lower number of criteria and is already applied in the market, for example due to its application in the EPD methodology for power generation.

The methodology for splitting the emissions between the power output and the heat output, which is required because only the power output of the **CHP** plants is covered by the activities, is proposed in analogy to the Annex II of the Energy Efficiency Directive.

Rationale for choosing the proposed SC criteria and thresholds:

1. Acidification potential (kg SO2 eq per MWh)

Includes SO2 and NOx (and depending on methodology, further pollutants)

Very significant parameter because current emissions from electricity generation are very high. The proposed conversion factors are based on Hauschild & Wenzel, 1998.

Pending decision on the threshold level of Acidification potential:

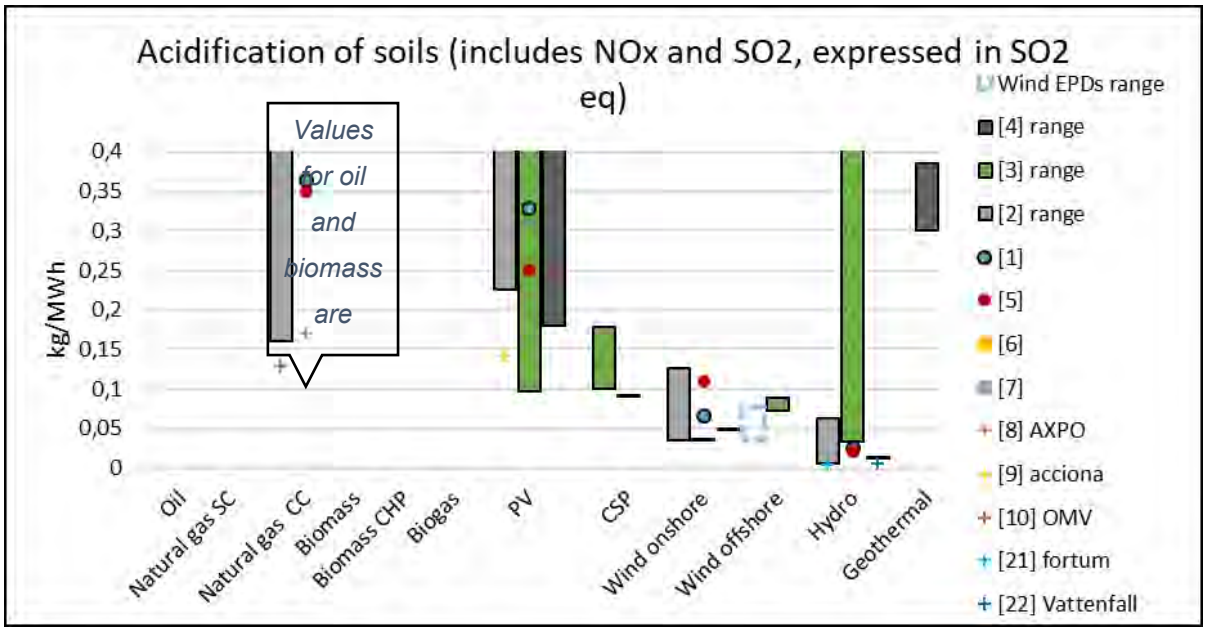
Threshold Options (all expressed in kgSO2eq per MWh):

a) 0.05

b) 0.15

c) 0.10

The result of the data analysis is shown in the following chart, the arguments for each of the three threshold levels are presented after the chart.



[1] to [7] represent data from scientific publications (filled circles and range bars), [8]-22] represent EPDs (with [11-20] wind power EPDs shown as blue dashed range), [10] Represents NOx and SOx data from emission compliance monitoring & measurement from the power plant and internally calculated pollution data (NOx/SOx) from upstream gas field operation (based on officially reported fuel consumption for gas field operation) from the fuel provision part.

Arguments for the three threshold options:

a) 0.05

This threshold is achieved by a part of literature data (representing somewhat older data) and part of recent wind plant data as well as all recent and part of older hydropower; (currently) not achieved by PV/CSP, geothermal and natural gas.

Arguments in favour of this threshold:

- Pro:
  Evidence is robust that it is possible to generate power by wind power and hydropower at this performance level (i.e. the threshold does not represent a single best performing plant, but is achieved by a range of plants, as shown by different literature sources and recent EPDs).

- Pro:
  This is the most ambitious threshold choice. The PSFs Headline Ambition Level for the Objective “Pollution Prevention and Control” sets 2030 as the target year for preventing and eliminating pollution. Power plants and infrastructure have a long lifetime, roughly 30 – 100 years. So the current criteria proposals will cover physical infrastructure which will still be largely in operation by 2030 and thus is relevant for achieving the 2030 target. Based on the assessment carried out, it is not possible to fully prevent or eliminate pollution for power generation. However, by this threshold choice, the taxonomy highlights the strongest (currently possible) contributing performing activities to the Headline Ambition.

- Pro:
  In the area of pollution, the Green Deals is very ambitions and specifies “Zero Pollution” at the EU’s target. Likewise, the EC recently published the “Zero pollution action plan”. Therefore is appropriate to set the pollution threshold in the taxonomy, which is a voluntary and transparency instrument, to the most ambitions threshold choice.

- Pro:
  This level is achievable by wind onshore, wind offshore and hydropower, thus not limited to a single technology. (Possibly also soon achievable by PV/CSP due to rapid technology development and reduction of coal-related pollution in power generation for component production process.)

- Pro:
  To set this threshold, for which in none of the activities (technologies) every plant achieves this level, gives incentives to some activities to improve.

b) 0.15

This threshold is achieved by all of analysed wind energy data, most hydropower (all of the recent EPDs), CSP and the best PV and the best performing gas (CC gas plants).

Arguments in favour of this threshold:

- Pro:
  This level can be achieved by more technologies, e.g. best-performing gas power plants, therefore more assets included

- Pro:
  The initial Ramboll study has assessed a high improvement opportunity for the sector energy production and distribution. Identified improvement opportunities for achieving high improvement potential are related to technical and (post-)combustion modification and NOx/SOx removal processes. Having the acidification threshold set at 0.15 would give the opportunity for high performing CCGT with low pollution impact from upstream fuel provision to deliver substantial positive environmental impact on the basis of life-cycle considerations.

- Pro:
  It gives incentives for gas power plants (CCGT: combined-cycle gas turbine) and gas-fired CHP, so they reduce their pollution, in a way that they could contribute to EU objectives.

On the proposed, possible option of exempting wind power from demonstrating SC in case of the threshold level of 0.15:

At this threshold level, wind power could be exempted from proving threshold compliance, because based on the analysed data, it appears that all wind power will achieve this performance level.

c) 0.10

This threshold is achieved by all of recent wind energy (EPD) and all of recent hydropower data (EPDs, they are existing/old power plants); some CSP and some of PV (1 recent plant not), not by gas.

Arguments in favour of this threshold:

- Pro: “compromise solution” between 0.05 and 0.15.

2. Photochemical ozone creation potential: **0.05** kg C2H2 eq per MWh

The proposed threshold is achieved by geothermal, hydro (except 1 source), wind, CSP, most PV, partly by biomass, most natural gas CC.

This parameter covers in particular CO, NOx and VOCs (volatile organic compounds). VOCs are classified into the following categories: alkanes, halogenated HCs, alcohols, ketones, esters, ethers, olefins,

acetylenes, aromatics and aldehydes.

3. Eutrophication potential: **0.05** kg PO43- eq per MWh

The proposed threshold is for PV possible to achieve, achieved by most hydro, achieved by all wind and geothermal as well as CSP; partly achieved by gas CC and PV. The proposed conversion factors are based on Heijungs et al. (1992).

4. PM10: **0.05** kg/per MWh

The proposed threshold is achieved by all wind, all hydro, most gas CC, all EPDs plants.

5. PM2.5: **0.02** kg/per MWh

The proposed threshold is achieved by almost all wind, all hydro, PV most recent data, gas CC.

6. Activity-specific criteria

These parameters, which have been set for DNSH for some of these activities in the Delegated act on climate change mitigation, dealing with specific issues only relevant for certain technologies (e.g. anti-fouling paint and biocides for ocean energy technologies), or to ensure current EU legal minimum environmental performance (e.g. for direct emissions, achieving the BAT-AEL ranges where applicable), **are proposed in addition to the five common overarching SC criteria**.

In the case of power generation from natural gas, the criteria from the activity "4.7 Electricity generation from renewable non-fossil gaseous and liquid fuels" of the climate change mitigation DA were used, because they cover the same legislation that also applies to natural gas-fired power plants (BAT, Medium combustion plant directive).

Pollutants considered, but not included in proposal

Metals and metalloids (As, Cd, Pb; Hg) and PAH: would have been relevant for biomass, but power generation is not proposed as an activity for other reasons (see above); poor data availability for life-cycle emissions of these pollutants was noted.

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https://portal.environdec.com/api/api/v1/EPDLibrary/Files/e54fd650-85b8-48e9-9bd3-c9379370da1b/Data

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3.6 Electricity generation from ocean energy technologies

Description of the activity

Construction or operation of electricity generation facilities that produce electricity from ocean energy. (as in 4.4 Climate change mitigation DA)

The economic activities in this category could be associated with several NACE codes, in particular D35.11 [Production of electricity] and F42.22 [Construction of utility projects for electricity and telecommunications] in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006. (as in Climate change mitigation DA)

Substantial contribution to pollution prevention and control

The activity complies with all of the following criteria:

1. Acidification potential

Pending decision on the threshold level (see Rationale for details):

Threshold Options:

The life-cycle emissions of pollutants contributing to the acidification potential are lower than…

- **0.05**
- **0.15** (possible exemption: wind power does not have to demonstrate achievement of this threshold)
- **0.10**

… kg SO_2 eq per 1 MWh of electricity output to the power grid or to directly connected customers. The calculation of the acidification potential includes all pollutants relevant for the activity, in particular NO_x, SO_2 and NH_3.

2. Photochemical ozone creation potential:

The life-cycle emissions of pollutants contributing to the photochemical ozone creation potential are lower than **0.05** kg C2H2 eq per 1 MWh of electricity output to the power grid or to directly connected customers. The calculation of the photochemical ozone creation potential includes all pollutants relevant for the activity, in particular CO, NOx and relevant VOCs.

3. Eutrophication potential:

The life-cycle emissions of pollutants contributing to the photochemical ozone creation potential are lower than **0.05** kg PO43- eq per 1 MWh of electricity output to the power grid or to directly connected customers. The calculation of the eutrophication potential includes all pollutants relevant for the activity, in particular NO_x, NH_4^+, N, PO_4^{3-}, P and COD (chemical oxygen demand).

4. Particulate matter PM10:

The life-cycle emissions of PM10 are lower than **0.05** kg/per 1 MWh of electricity output to the power grid or to directly connected customers.

5. Fine particulate matter PM2.5:

The life-cycle emissions of PM10 are lower than **0.02** kg/per 1 MWh of electricity output to the power grid or to directly connected customers.

6. Activity-specific criteria:

Measures are in place to minimise toxicity of **anti-fouling paint and biocides** as laid down in Regulation (EU) No 528/2012 of the European Parliament and of the Council[358], which implements in Union law the International Convention on the Control of Harmful Anti-fouling Systems on Ships adopted on 5 October 2001.

Methodology for calculation of criterion 1. Acidification potential, 2. Photochemical ozone creation and 3. Eutrophication based on one of the following:

- Life-cycle environmental impacts are calculated using Commission Recommendation 2013/179/EU or, alternatively, using ISO 14025:2010 and ISO 14040:2006 and ISO 14044:2006. Lifecycle environmental impacts are third party verified in according with the procedure described in ISO 14044.

Do no significant harm ('DNSH')

(1) Climate change mitigation	*This criterion is not in the scope of this call for feedback.* .
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.
(3) Sustainable use and protection of	The activity does not hamper the achievement of good environmental status, as set out in Directive 2008/56/EC, requiring that the appropriate

[358] Regulation (EU) No 528/2012 of the European Parliament and of the Council of 22 May 2012 concerning the making available on the market and use of biocidal products (OJ L 167, 27.6.2012, p. 1).

water and marine resources	measures are taken to prevent or mitigate impacts in relation to that Directive's Descriptor 11 (Noise/Energy), laid down in Annex I to that Directive, and as set out in Decision (EU) 2017/848 in relation to the relevant criteria and methodological standards for that descriptor.
(4) Transition to circular economy	The activity assesses availability of and, where feasible, uses equipment and components of high durability and recyclability and that are easy to dismantle and refurbish.
(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appending D of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852. The activity does not hamper the achievement of good environmental status, as set out in Directive 2008/56/EC, requiring that the appropriate measures are taken to prevent or mitigate impacts in relation to that Directive's Descriptor 1 (biodiversity), laid down in Annex I to that Directive, and as set out in Decision (EU) 2017/848 in relation to the relevant criteria and methodological standards for those descriptors.

Rationale

On the choice of activities (i.e. different technologies) for power generation

The selection includes **activities** for which the conducted analysis shows that they are **in principle capable of fulfilling the proposed TSC**. Depending on the pending decision which SC threshold is selected for the Acidification Potential, not for all proposed activities, evidence was found that they could fulfil the TSC; however, due the available data for life-cycle pollutant emissions are limited, so when in doubt, the activities in question were included in the proposal (e.g. power from geothermal energy).

Nevertheless, other activities (technologies) are not included in the proposal. Power generation using liquid fuels (oil) and biomass were not included because the available data range showed their performance concerning the pollution objective is, by far, insufficient to achieve with the

proposed SC thresholds. Therefore it appears unrealistic that currently any aligned assets exist that could be invested in. Hence, these activities are not proposed for the taxonomy.

Both combined heat and power generation (**CHP, cogeneration**) and power generation without heat utilisation are included.

On the criteria for substantial contribution (SC)

For all power generation activities, the same **overarching thresholds for five pollution criteria** are proposed. They address the most significant air pollutant emissions resulting from these activities in the European Union at present. These five criteria cover **life-cycle** emissions, i.e. the value chain until the generated power is delivered to the grid (or to directly connected customers), which includes direct emissions during electricity generation and indirection emissions from upstream stages (fuel production and transport), construction of the power generation facilities and production of the required components.

For **some of the activities, additional criteria** are proposed, to account for environmental specificities of the activity, or to ensure that EU legal requirements, which apply to direct instead life-cycle emissions, are also fulfilled. (These were taken from the DA Climate change mitigation criteria for DNSH concerning the Pollution objective of these activities.)

The proposed **SC threshold levels** result from the analysis of life-cycle pollution data from scientific publications and recent Environmental Product Declarations (EPDs), covering power generation using different technologies.

In the available data sources, the pollutants are either reported by substance (e.g. NOx, SO2, …) or partly combined to **metrics per type of environmental impact** (e.g. the acidification potential, which covers NOx and SO2 and, depending on the methodology, some further acidifying substances which are emitted at lower levels in power generation).

The proposed criteria use the approach of grouping pollutants based on their environmental impact. This choice allows for a lower number of criteria and is already applied in the market, for example due to its application in the EPD methodology for power generation.

The methodology for splitting the emissions between the power output and the heat output, which is required because only the power output of the **CHP** plants is covered by the activities, is proposed in analogy to the Annex II of the Energy Efficiency Directive.

Rationale for choosing the proposed SC criteria and thresholds:

1. Acidification potential (kg SO2 eq per MWh)

Includes SO2 and NOx (and depending on methodology, further pollutants)

Very significant parameter because current emissions from electricity generation are very high. The proposed conversion factors are based on Hauschild & Wenzel, 1998.

Pending decision on the threshold level of Acidification potential:

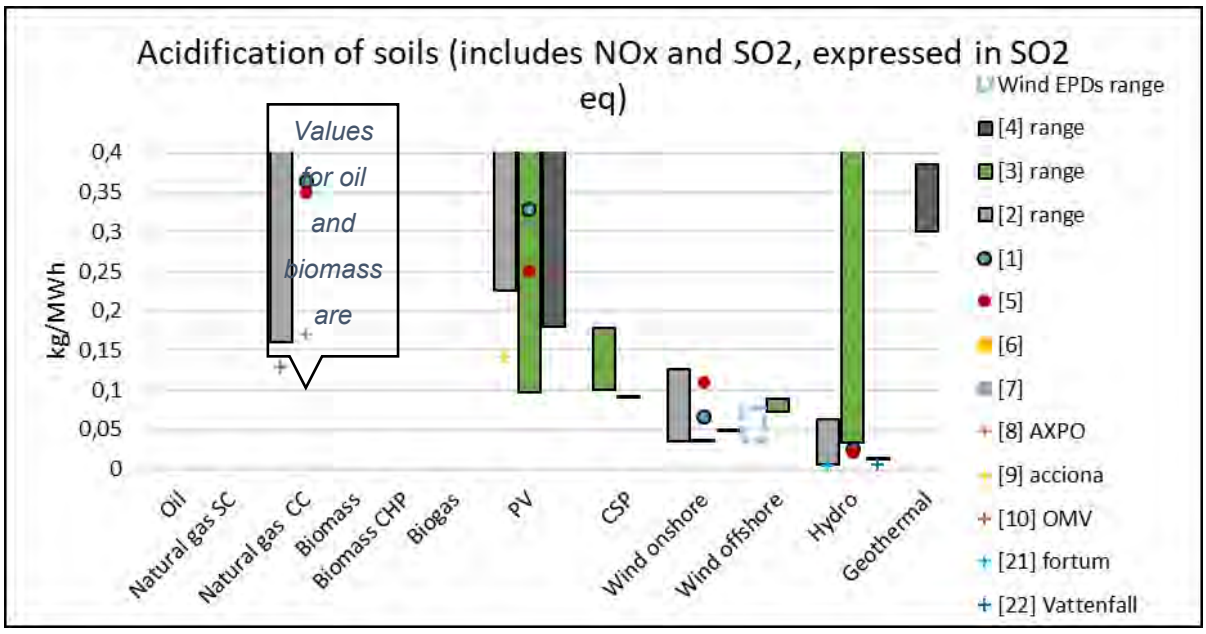
Threshold Options (all expressed in kgSO2eq per MWh):

a) 0.05

b) 0.15

c) 0.10

The result of the data analysis is shown in the following chart, the arguments for each of the three threshold levels are presented after the chart.



[1] to [7] represent data from scientific publications (filled circles and range bars), [8]-22] represent EPDs (with [11-20] wind power EPDs shown as blue dashed range), [10] Represents NOx and SOx data from emission compliance monitoring & measurement from the power plant

and internally calculated pollution data (NOx/SOx) from upstream gas field operation (based on officially reported fuel consumption for gas field operation) from the fuel provision part.

Arguments for the three threshold options:

a) 0.05

This threshold is achieved by a part of literature data (representing somewhat older data) and part of recent wind plant data as well as all recent and part of older hydropower; (currently) not achieved by PV/CSP, geothermal and natural gas.

Arguments in favour of this threshold:

- Pro:
  Evidence is robust that it is possible to generate power by wind power and hydropower at this performance level (i.e. the threshold does not represent a single best performing plant, but is achieved by a range of plants, as shown by different literature sources and recent EPDs).

- Pro:
  This is the most ambitious threshold choice. The PSFs Headline Ambition Level for the Objective “Pollution Prevention and Control” sets 2030 as the target year for preventing and eliminating pollution. Power plants and infrastructure have a long lifetime, roughly 30 – 100 years. So the current criteria proposals will cover physical infrastructure which will still be largely in operation by 2030 and thus is relevant for achieving the 2030 target. Based on the assessment carried out, it is not possible to fully prevent or eliminate pollution for power generation. However, by this threshold choice, the taxonomy highlights the strongest (currently possible) contributing performing activities to the Headline Ambition.

- Pro:
  In the area of pollution, the Green Deals is very ambitions and specifies “Zero Pollution” at the EU’s target. Likewise, the EC recently published the “Zero pollution action plan”. Therefore is appropriate to set the pollution threshold in the taxonomy, which is a voluntary and transparency instrument, to the most ambitions threshold choice.

- Pro:
  This level is achievable by wind onshore, wind offshore and hydropower, thus not limited to a single technology. (Possibly also soon achievable by PV/CSP due to rapid technology development and reduction of coal-related pollution in power generation for component production process.)

- Pro:
  To set this threshold, for which in none of the activities (technologies) every plant achieves this level, gives incentives to some activities to improve.

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This threshold is achieved by all of analysed wind energy data, most hydropower (all of the recent EPDs), CSP and the best PV and the best performing gas (CC gas plants).

Arguments in favour of this threshold:

- Pro:
  This level can be achieved by more technologies, e.g. best-performing gas power plants, therefore more assets included

- Pro:
  The initial Ramboll study has assessed a high improvement opportunity for the sector energy production and distribution. Identified improvement opportunities for achieving high improvement potential are related to technical and (post-)combustion modification and NOx/SOx removal processes. Having the acidification threshold set at 0.15 would give the opportunity for high performing CCGT with low pollution impact from upstream fuel provision to deliver substantial positive environmental impact on the basis of life-cycle considerations.

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  It gives incentives for gas power plants (CCGT: combined-cycle gas turbine) and gas-fired CHP, so they reduce their pollution, in a way that they could contribute to EU objectives.

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At this threshold level, wind power could be exempted from proving threshold compliance, because based on the analysed data, it appears that all wind power will achieve this performance level.

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This threshold is achieved by all of recent wind energy (EPD) and all of recent hydropower data (EPDs, they are existing/old power plants); some CSP and some of PV (1 recent plant not), not by gas.

Arguments in favour of this threshold:

- Pro: “compromise solution” between 0.05 and 0.15.

2. Photochemical ozone creation potential: **0.05** kg C2H2 eq per MWh

The proposed threshold is achieved by geothermal, hydro (except 1 source), wind, CSP, most PV, partly by biomass, most natural gas CC.

This parameter covers in particular CO, NOx and VOCs (volatile organic compounds). VOCs are classified into the following categories: alkanes, halogenated HCs, alcohols, ketones, esters, ethers, olefins,

acetylenes, aromatics and aldehydes.

3. Eutrophication potential: **0.05** kg PO43- eq per MWh

The proposed threshold is for PV possible to achieve, achieved by most hydro, achieved by all wind and geothermal as well as CSP; partly achieved by gas CC and PV. The proposed conversion factors are based on Heijungs et al. (1992).

4. PM10: **0.05** kg/per MWh

The proposed threshold is achieved by all wind, all hydro, most gas CC, all EPDs plants.

5. PM2.5: **0.02** kg/per MWh

The proposed threshold is achieved by almost all wind, all hydro, PV most recent data, gas CC.

6. Activity-specific criteria

These parameters, which have been set for DNSH for some of these activities in the Delegated act on climate change mitigation, dealing with specific issues only relevant for certain technologies (e.g. anti-fouling paint and biocides for ocean energy technologies), or to ensure current EU legal minimum environmental performance (e.g. for direct emissions, achieving the BAT-AEL ranges where applicable), **are proposed in addition to the five common overarching SC criteria**.

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Pollutants considered, but not included in proposal

Metals and metalloids (As, Cd, Pb; Hg) and PAH: would have been relevant for biomass, but power generation is not proposed as an activity for other reasons (see above); poor data availability for life-cycle emissions of these pollutants was noted.

Sources

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3.7 Electricity generation from hydropower

Description of the activity

Construction or operation of electricity generation facilities that produce electricity from hydropower. (as in 4.5 Climate change mitigation DA)

The economic activities in this category could be associated with several NACE codes, in particular D35.11 [Production of electricity] and F42.22 [Construction of utility projects for electricity and telecommunications] in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006. (as in Climate change mitigation DA)

Substantial contribution to pollution prevention and control

The activity complies with all of the following criteria:

1. Acidification potential

Pending decision on the threshold level (see Rationale for details):

Threshold Options:

The life-cycle emissions of pollutants contributing to the acidification potential are lower than…

- **0.05**
- **0.15** (possible exemption: wind power does not have to demonstrate achievement of this threshold)
- **0.10**

… kg SO_2 eq per 1 MWh of electricity output to the power grid or to directly connected customers. The calculation of the acidification potential includes all pollutants relevant for the activity, in particular NO_x, SO_2 and NH_3.

2. Photochemical ozone creation potential:

The life-cycle emissions of pollutants contributing to the photochemical ozone creation potential are lower than **0.05** kg C2H2 eq per 1 MWh of electricity output to the power grid or to directly connected customers. The calculation of the photochemical ozone creation potential includes all pollutants relevant for the activity, in particular CO, NOx and relevant VOCs.

3. Eutrophication potential:

The life-cycle emissions of pollutants contributing to the photochemical ozone creation potential are lower than **0.05** kg PO43- eq per 1 MWh of electricity output to the power grid or to directly connected customers. The calculation of the eutrophication potential includes all pollutants relevant for the activity, in particular NO_x, NH_4^+, N, PO_4^{3-}, P and COD (chemical oxygen demand).

4. Particulate matter PM10:

The life-cycle emissions of PM10 are lower than **0.05** kg/per 1 MWh of electricity output to the power grid or to directly connected customers.

5. Fine particulate matter PM2.5:

The life-cycle emissions of PM10 are lower than **0.02** kg/per 1 MWh of electricity output to the power grid or to directly connected customers.

6. Activity-specific criteria:

N/A

Methodology for calculation of criterion 1. Acidification potential, 2. Photochemical ozone creation and 3. Eutrophication based on one of the following:

- Life-cycle environmental impacts are calculated using Commission Recommendation 2013/179/EU or, alternatively, using ISO 14025:2010 and ISO 14040:2006 and ISO 14044:2006. Lifecycle environmental impacts are third party verified in according with the procedure described in ISO 14044.

Do no significant harm ('DNSH')

(1) Climate change mitigation	*This criterion is not in the scope of this call for feedback.*
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.
(3) Sustainable use and protection of water and marine resources	1. The activity complies with the provisions of Directive 2000/60/EC, in particular with all the requirements laid down in Article 4 of the Directive.

2. For operation of existing hydropower plants, including refurbishment activities to enhance renewable energy or energy storage potential, the activity complies with the following criteria:

2.1. In accordance with Directive 2000/60/EC and in particular Articles 4 and 11 of that Directive, all technically feasible and ecologically relevant mitigation measures have been implemented to reduce adverse impacts on water as well as on protected habitats and species directly dependent on water.

2.2. Measures include, where relevant and depending on the ecosystems naturally present in the affected water bodies:

(a) measures to ensure downstream and upstream fish migration (such as fish friendly turbines, fish guidance structures, state-of-the-art fully functional fish passes, measures to stop or minimise operation and discharges during migration or spawning);

(b) measures to ensure minimum ecological flow (including mitigation of rapid, short-term variations in flow or hydro-peaking operations) and sediment flow;

(c) measures to protect or enhance habitats.

2.3. The effectiveness of those measures is monitored in the context of the authorisation or permit setting out the conditions aimed at achieving good status or potential of the affected water body.

3. For construction of new hydropower plants, the activity complies with the following criteria:

3.1. In accordance with Article 4 of Directive 2000/60/EC and in particular paragraph 7 of that Article, prior to construction, an impact assessment of the project is carried out to assess all its potential impacts on the status of water bodies within the same river basin and on protected habitats and species directly dependent on water, considering in particular migration corridors, free-flowing rivers or ecosystems close to undisturbed conditions.

	The assessment is based on recent, comprehensive and accurate data, including monitoring data on biological quality elements that are specifically sensitive to hydromorphological alterations, and on the expected status of the water body as a result of the new activities, as compared to its current one. It assesses in particular the cumulated impacts of this new project with other existing or planned infrastructure in the river basin. 3.2. On the basis of that impact assessment, it has been established that the plant is conceived, by design and location and by mitigation measures, so that it complies with one of the following requirements: (a) the plant does not entail any deterioration nor compromises the achievement of good status or potential of the specific water body it relates to; (b) where the plant risks to deteriorate or compromise the achievement of good status/potential of the specific water body it relates to, such deterioration is not significant, and is justified by a detailed cost-benefit assessment demonstrating both of the following: (i) the reasons of overriding public interest or the fact that benefits expected from the planned hydropower plant outweigh the costs from deteriorating the status of water that are accruing to the environment and to society; (ii) the fact that the overriding public interest or the benefits expected from the plant cannot, for reasons of technical feasibility or disproportionate cost, be achieved by alternative means that would lead to a better environmental outcome (such as refurbishing of existing hydropower plants or use of technologies not disrupting river continuity). 3.3. All technically feasible and ecologically relevant mitigation measures are implemented to reduce adverse impacts on water as well as on protected habitats and species directly dependent on water.

	Mitigation measures include, where relevant and depending on the ecosystems naturally present in the affected water bodies: (a) measures to ensure downstream and upstream fish migration (such as fish friendly turbines, fish guidance structures, state-of the-art fully functional fish passes, measures to stop or minimise operation and discharges during migration or spawning); (b) measures to ensure minimum ecological flow (including mitigation of rapid, short-term variations in flow or hydro-peaking operations) and sediment flow; (c) measures to protect or enhance habitats. The effectiveness of those measures is monitored in the context of the authorisation or permit setting out the conditions aimed at achieving good status or potential of the affected water body. 3.4. The plant does not permanently compromise the achievement of good status/potential in any of the water bodies in the same river basin district. 3.5. In addition to the mitigation measures referred to above, and where relevant, compensatory measures are implemented to ensure that the project does not increase the fragmentation of water bodies in the same river basin district. This is achieved by restoring continuity within the same river basin district to an extent that compensates the disruption of continuity, which the planned hydropower plant may cause. Compensation starts prior to the execution of the project.
(4) Transition to circular economy	N/A
(6) Protection and restoration of	DNSH as set out in Appending D of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.

biodiversity and ecosystems	

Rationale

On the choice of activities (i.e. different technologies) for power generation

The selection includes **activities** for which the conducted analysis shows that they are **in principle capable of fulfilling the proposed TSC**. Depending on the pending decision which SC threshold is selected for the Acidification Potential, not for all proposed activities, evidence was found that they could fulfil the TSC; however, due the available data for life-cycle pollutant emissions are limited, so when in doubt, the activities in question were included in the proposal (e.g. power from geothermal energy).

Nevertheless, other activities (technologies) are not included in the proposal. Power generation using liquid fuels (oil) and biomass were not included because the available data range showed their performance concerning the pollution objective is, by far, insufficient to achieve with the proposed SC thresholds. Therefore it appears unrealistic that currently any aligned assets exist that could be invested in. Hence, these activities are not proposed for the taxonomy.

Both combined heat and power generation (**CHP, cogeneration**) and power generation without heat utilisation are included.

On the criteria for substantial contribution (SC)

For all power generation activities, the same **overarching thresholds for five pollution criteria** are proposed. They address the most significant air pollutant emissions resulting from these activities in the European Union at present. These five criteria cover **life-cycle** emissions, i.e. the value chain until the generated power is delivered to the grid (or to directly connected customers), which includes direct emissions during electricity generation and indirection emissions from upstream stages (fuel production and transport), construction of the power generation facilities and production of the required components.

For **some of the activities, additional criteria** are proposed, to account for environmental specificities of the activity, or to ensure that EU legal requirements, which apply to direct

instead life-cycle emissions, are also fulfilled. (These were taken from the DA Climate change mitigation criteria for DNSH concerning the Pollution objective of these activities.)

The proposed **SC threshold levels** result from the analysis of life-cycle pollution data from scientific publications and recent Environmental Product Declarations (EPDs), covering power generation using different technologies.

In the available data sources, the pollutants are either reported by substance (e.g. NOx, SO2, …) or partly combined to **metrics per type of environmental impact** (e.g. the acidification potential, which covers NOx and SO2 and, depending on the methodology, some further acidifying substances which are emitted at lower levels in power generation).

The proposed criteria use the approach of grouping pollutants based on their environmental impact. This choice allows for a lower number of criteria and is already applied in the market, for example due to its application in the EPD methodology for power generation.

The methodology for splitting the emissions between the power output and the heat output, which is required because only the power output of the **CHP** plants is covered by the activities, is proposed in analogy to the Annex II of the Energy Efficiency Directive.

Rationale for choosing the proposed SC criteria and thresholds:

1. Acidification potential (kg SO2 eq per MWh)

Includes SO2 and NOx (and depending on methodology, further pollutants)

Very significant parameter because current emissions from electricity generation are very high. The proposed conversion factors are based on Hauschild & Wenzel, 1998.

Pending decision on the threshold level of Acidification potential:

Threshold Options (all expressed in kg SO2 eq per MWh):

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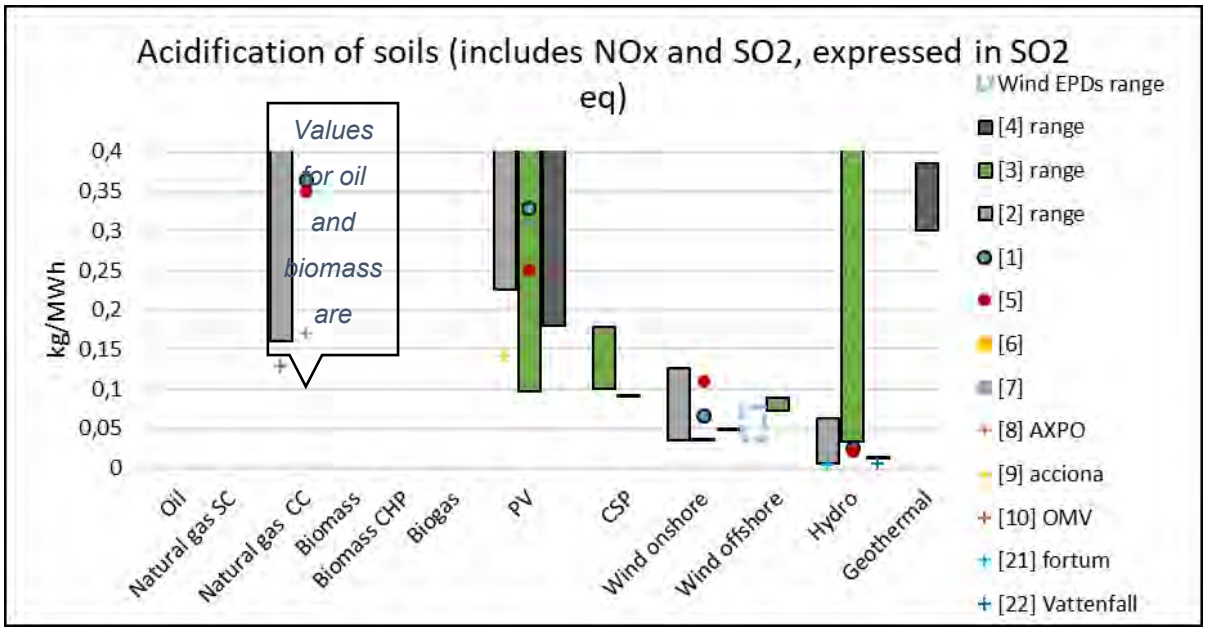

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[11] EPD Siemens Gamesa SG5.0-145 onshore wind Europe https://portal.environdec.com/api/api/v1/EPDLibrary/Files/cbde865c-fdea-43ef-a49d-8efe701d6842/Data

[12] 2019 EPD Vattenfall wind summary https://portal.environdec.com/api/api/v1/EPDLibrary/Files/644762eb-c06e-433f-a6e8-a695e54f72fe/Data

[13] 2018 EPD Siemens Gamesa SG2.1_122 onshore wind India https://portal.environdec.com/api/api/v1/EPDLibrary/Files/c22743aa-eec6-41e8-a485-fd16e980c570/Data

[14] 2019 EPD Siemens Gamesa SG4.5-145 onshore wind Europe https://portal.environdec.com/api/api/v1/EPDLibrary/Files/902fb2d4-dae4-4442-8f23-8a300b997422/Data

[15] 2020 EPD Siemens Gamesa SG5.0-132 onshore wind Europe https://portal.environdec.com/api/api/v1/EPDLibrary/Files/e54fd650-85b8-48e9-9bd3-c9379370da1b/Data

[16] 2020 EPD Siemens Gamesa SG2.6-114 onshore wind Europe https://portal.environdec.com/api/api/v1/EPDLibrary/Files/3af441dc-28ce-4f58-b9d6-4a269bd2e051/Data

[17] 2018 EPD Mt. Gellibrand 132 MW onshore wind https://portal.environdec.com/api/api/v1/EPDLibrary/Files/bfbccc82-e6d5-4d37-98a6-af6608a41e43/Data

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[22] 2021 EPD Vattenfall Nordic Hydropower, Environmental Product Declaration Vattenfalls Nordic Hydropower https://portal.environdec.com/api/api/v1/EPDLibrary/Files/fc28fbf0-21fa-47fc-ab0b-08d8c11ab8a5/Data

3.8 Electricity generation from geothermal energy

Description of the activity

Construction or operation of electricity generation facilities that produce electricity from geothermal energy. (4.6 Climate change mitigation DA)

The economic activities in this category could be associated with several NACE codes, in particular D35.11 [Production of electricity] and F42.22 [Construction of utility projects for electricity and telecommunications] in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006. (4.6 Climate change mitigation DA)

Substantial contribution to pollution prevention and control

The activity complies with all of the following criteria:

1. Acidification potential

Pending decision on the threshold level (see Rationale for details):

Threshold Options:

The life-cycle emissions of pollutants contributing to the acidification potential are lower than…

- **0.05**

- **0.15** (possible exemption: wind power does not have to demonstrate achievement of this threshold)

- **0.10**

… kg SO_2 eq per 1 MWh of electricity output to the power grid or to directly connected customers. The calculation of the acidification potential includes all pollutants relevant for the activity, in particular NO_x, SO_2 and NH_3.

2. Photochemical ozone creation potential:

The life-cycle emissions of pollutants contributing to the photochemical ozone creation potential are lower than **0.05** kg C2H2 eq per 1 MWh of electricity output to the power grid or to directly connected customers. The calculation of the photochemical ozone creation potential includes all pollutants relevant for the activity, in particular CO, NOx and relevant VOCs.

3. Eutrophication potential:

The life-cycle emissions of pollutants contributing to the photochemical ozone creation potential are lower than **0.05** kg PO43- eq per 1 MWh of electricity output to the power grid or to directly connected customers. The calculation of the eutrophication potential includes all pollutants relevant for the activity, in particular NO_x, NH_4^+, N, PO_4^{3-}, P and COD (chemical oxygen demand).

4. Particulate matter PM10:

The life-cycle emissions of PM10 are lower than **0.05** kg/per 1 MWh of electricity output to the power grid or to directly connected customers.

5. Fine particulate matter PM2.5:

The life-cycle emissions of PM10 are lower than **0.02** kg/per 1 MWh of electricity output to the power grid or to directly connected customers.

6. Activity-specific criteria:

For the operation of high-enthalpy geothermal energy systems, adequate abatement systems are in place to reduce emission levels in order not to hamper the achievement of air quality

limit values set out in Directive 2004/107/EC of the European Parliament and of the Council[359] and Directive 2008/50/EC of the European Parliament and of the Council[360].

Methodology for calculation of criterion 1. Acidification potential, 2. Photochemical ozone creation and 3. Eutrophication based on one of the following:

- Life-cycle environmental impacts are calculated using Commission Recommendation 2013/179/EU or, alternatively, using ISO 14025:2010 and ISO 14040:2006 and ISO 14044:2006. Lifecycle environmental impacts are third party verified in according with the procedure described in ISO 14044.

Do no significant harm ('DNSH')

(1) Climate change mitigation	*This criterion is not in the scope of this call for feedback.*
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.
(3) Sustainable use and protection of water and marine resources	DNSH as set out in Appending B of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.

[359] Directive 2004/107/EC of the European Parliament and of the Council of 15 December 2004 relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air (OJ L 23, 26.1.2005, p. 3).

[360] Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe (OJ L 152, 11.6.2008, p. 1).

(4) Transition to circular economy	N/A
(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appending D of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.

Rationale

On the choice of activities (i.e. different technologies) for power generation

The selection includes **activities** for which the conducted analysis shows that they are **in principle capable of fulfilling the proposed TSC**. Depending on the pending decision which SC threshold is selected for the Acidification Potential, not for all proposed activities, evidence was found that they could fulfil the TSC; however, due the available data for life-cycle pollutant emissions are limited, so when in doubt, the activities in question were included in the proposal (e.g. power from geothermal energy).

Nevertheless, other activities (technologies) are not included in the proposal. Power generation using liquid fuels (oil) and biomass were not included because the available data range showed their performance concerning the pollution objective is, by far, insufficient to achieve with the proposed SC thresholds. Therefore it appears unrealistic that currently any aligned assets exist that could be invested in. Hence, these activities are not proposed for the taxonomy.

Both combined heat and power generation (**CHP, cogeneration**) and power generation without heat utilisation are included.

On the criteria for substantial contribution (SC)

For all power generation activities, the same **overarching thresholds for five pollution criteria** are proposed. They address the most significant air pollutant emissions resulting from these activities in the European Union at present. These five criteria cover **life-cycle** emissions, i.e. the value chain until the generated power is delivered to the grid (or to directly connected customers), which includes direct emissions during electricity generation and

indirection emissions from upstream stages (fuel production and transport), construction of the power generation facilities and production of the required components.

For **some of the activities, additional criteria** are proposed, to account for environmental specificities of the activity, or to ensure that EU legal requirements, which apply to direct instead life-cycle emissions, are also fulfilled. (These were taken from the DA Climate change mitigation criteria for DNSH concerning the Pollution objective of these activities.)

The proposed **SC threshold levels** result from the analysis of life-cycle pollution data from scientific publications and recent Environmental Product Declarations (EPDs), covering power generation using different technologies.

In the available data sources, the pollutants are either reported by substance (e.g. NOx, SO2, …) or partly combined to **metrics per type of environmental impact** (e.g. the acidification potential, which covers NOx and SO2 and, depending on the methodology, some further acidifying substances which are emitted at lower levels in power generation).

The proposed criteria use the approach of grouping pollutants based on their environmental impact. This choice allows for a lower number of criteria and is already applied in the market, for example due to its application in the EPD methodology for power generation.

The methodology for splitting the emissions between the power output and the heat output, which is required because only the power output of the **CHP** plants is covered by the activities, is proposed in analogy to the Annex II of the Energy Efficiency Directive.

Rationale for choosing the proposed SC criteria and thresholds:

1. Acidification potential (kg SO2 eq per MWh)

Includes SO2 and NOx (and depending on methodology, further pollutants)

Very significant parameter because current emissions from electricity generation are very high. The proposed conversion factors are based on Hauschild & Wenzel, 1998.

Pending decision on the threshold level of Acidification potential:

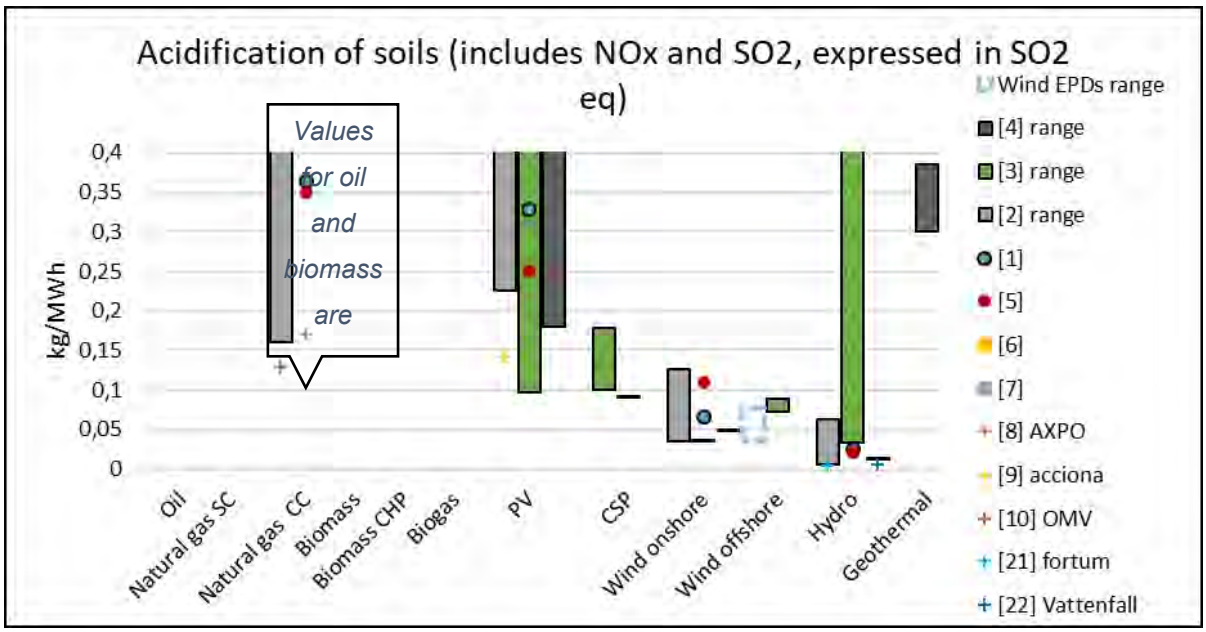
Threshold Options (all expressed in kg SO2 eq per MWh):

a) 0.05

b) 0.15

c) 0.10

The result of the data analysis is shown in the following chart, the arguments for each of the three threshold levels are presented after the chart.



[1] to [7] represent data from scientific publications (filled circles and range bars), [8]-22] represent EPDs (with [11-20] wind power EPDs shown as blue dashed range), [10] Represents NOx and SOx data from emission compliance monitoring & measurement from the power plant and internally calculated pollution data (NOx/SOx) from upstream gas field operation (based on officially reported fuel consumption for gas field operation) from the fuel provision part.

Arguments for the three threshold options:

a) 0.05

This threshold is achieved by a part of literature data (representing somewhat older data) and part of recent wind plant data as well as all recent and part of older hydropower; (currently) not achieved by PV/CSP, geothermal and natural gas.

Arguments in favour of this threshold:

- Pro:
  Evidence is robust that it is possible to generate power by wind power and

hydropower at this performance level (i.e. the threshold does not represent a single best performing plant, but is achieved by a range of plants, as shown by different literature sources and recent EPDs).

- Pro:
  This is the most ambitious threshold choice. The PSFs Headline Ambition Level for the Objective “Pollution Prevention and Control” sets 2030 as the target year for preventing and eliminating pollution. Power plants and infrastructure have a long lifetime, roughly 30 – 100 years. So the current criteria proposals will cover physical infrastructure which will still be largely in operation by 2030 and thus is relevant for achieving the 2030 target. Based on the assessment carried out, it is not possible to fully prevent or eliminate pollution for power generation. However, by this threshold choice, the taxonomy highlights the strongest (currently possible) contributing performing activities to the Headline Ambition.

- Pro:
  In the area of pollution, the Green Deals is very ambitions and specifies “Zero Pollution” at the EU’s target. Likewise, the EC recently published the “Zero pollution action plan”. Therefore is appropriate to set the pollution threshold in the taxonomy, which is a voluntary and transparency instrument, to the most ambitions threshold choice.

- Pro:
  This level is achievable by wind onshore, wind offshore and hydropower, thus not limited to a single technology. (Possibly also soon achievable by PV/CSP due to rapid technology development and reduction of coal-related pollution in power generation for component production process.)

- Pro:
  To set this threshold, for which in none of the activities (technologies) every plant achieves this level, gives incentives to some activities to improve.

b) 0.15

This threshold is achieved by all of analysed wind energy data, most hydropower (all of the recent EPDs), CSP and the best PV and the best performing gas (CC gas plants).

Arguments in favour of this threshold:

- Pro:
  This level can be achieved by more technologies, e.g. best-performing gas power plants, therefore more assets included

- Pro:
  The initial Ramboll study has assessed a high improvement opportunity for the sector energy production and distribution. Identified improvement opportunities for achieving high improvement potential are related to technical and (post-)combustion modification and NOx/SOx removal processes. Having the acidification threshold set at 0.15 would give the opportunity for high performing CCGT with low pollution impact from upstream fuel provision to deliver substantial positive environmental impact on the basis of life-cycle considerations.

- Pro:
  It gives incentives for gas power plants (CCGT: combined-cycle gas turbine) and gas-fired CHP, so they reduce their pollution, in a way that they could contribute to EU objectives.

On the proposed, possible option of exempting wind power from demonstrating SC in case of the threshold level of 0.15:

At this threshold level, wind power could be exempted from proving threshold compliance, because based on the analysed data, it appears that all wind power will achieve this performance level.

c) 0.10

This threshold is achieved by all of recent wind energy (EPD) and all of recent hydropower data (EPDs, they are existing/old power plants); some CSP and some of PV (1 recent plant not), not by gas.

Arguments in favour of this threshold:

- Pro: “compromise solution” between 0.05 and 0.15.

2. Photochemical ozone creation potential: **0.05** kg C2H2 eq per MWh

The proposed threshold is achieved by geothermal, hydro (except 1 source), wind, CSP, most PV, partly by biomass, most natural gas CC.

This parameter covers in particular CO, NOx and VOCs (volatile organic compounds). VOCs are classified into the following categories: alkanes, halogenated HCs, alcohols, ketones, esters, ethers, olefins,

acetylenes, aromatics and aldehydes.

3. Eutrophication potential: **0.05** kg PO43- eq per MWh

The proposed threshold is for PV possible to achieve, achieved by most hydro, achieved by all wind and geothermal as well as CSP; partly achieved by gas CC and PV. The proposed conversion factors are based on Heijungs et al. (1992).

4. PM10: **0.05** kg/per MWh

The proposed threshold is achieved by all wind, all hydro, most gas CC, all EPDs plants.

5. PM2.5: **0.02** kg/per MWh

The proposed threshold is achieved by almost all wind, all hydro, PV most recent data, gas CC.

6. Activity-specific criteria

These parameters, which have been set for DNSH for some of these activities in the Delegated act on climate change mitigation, dealing with specific issues only relevant for certain technologies (e.g. anti-fouling paint and biocides for ocean energy technologies), or to ensure current EU legal minimum environmental performance (e.g. for direct emissions, achieving the BAT-AEL ranges where applicable), **are proposed in addition to the five common overarching SC criteria**.

In the case of power generation from natural gas, the criteria from the activity “4.7 Electricity generation from renewable non-fossil gaseous and liquid fuels” of the climate change

mitigation DA were used, because they cover the same legislation that also applies to natural gas-fired power plants (BAT, Medium combustion plant directive).

Pollutants considered, but not included in proposal

Metals and metalloids (As, Cd, Pb; Hg) and PAH: would have been relevant for biomass, but power generation is not proposed as an activity for other reasons (see above); poor data availability for life-cycle emissions of these pollutants was noted.

Sources

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[10] 2020 OMV 860 MW CCPP Braz

[11] EPD Siemens Gamesa SG5.0-145 onshore wind Europe https://portal.environdec.com/api/api/v1/EPDLibrary/Files/cbde865c-fdea-43ef-a49d-8efe701d6842/Data

[12] 2019 EPD Vattenfall wind summary https://portal.environdec.com/api/api/v1/EPDLibrary/Files/644762eb-c06e-433f-a6e8-a695e54f72fe/Data

[13] 2018 EPD Siemens Gamesa SG2.1_122 onshore wind India https://portal.environdec.com/api/api/v1/EPDLibrary/Files/c22743aa-eec6-41e8-a485-fd16e980c570/Data

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[15] 2020 EPD Siemens Gamesa SG5.0-132 onshore wind Europe https://portal.environdec.com/api/api/v1/EPDLibrary/Files/e54fd650-85b8-48e9-9bd3-c9379370da1b/Data

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[17] 2018 EPD Mt. Gellibrand 132 MW onshore wind https://portal.environdec.com/api/api/v1/EPDLibrary/Files/bfbccc82-e6d5-4d37-98a6-af6608a41e43/Data

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[22] 2021 EPD Vattenfall Nordic Hydropower, Environmental Product Declaration Vattenfalls Nordic Hydropower https://portal.environdec.com/api/api/v1/EPDLibrary/Files/fc28fbf0-21fa-47fc-ab0b-08d8c11ab8a5/Data

3.9 Electricity generation from natural gas

Description of the activity

Construction or operation of electricity generation facilities that produce electricity using natural gas.

The economic activities in this category could be associated with several NACE codes, in particular D35.11 [Production of electricity] and F42.22 [Construction of utility projects for electricity and telecommunications] in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

(similar to 4.7 Climate change mitigation DA, but instead natural gas as fuel)

Substantial contribution to pollution prevention and control

The activity complies with all of the following criteria:

1. Acidification potential

Pending decision on the threshold level (see Rationale for details):

Threshold Options:

The life-cycle emissions of pollutants contributing to the acidification potential are lower than…

- **0.05**
- **0.15** (possible exemption: wind power does not have to demonstrate achievement of this threshold)
- **0.10**

… kg SO_2 eq per 1 MWh of electricity output to the power grid or to directly connected customers. The calculation of the acidification potential includes all pollutants relevant for the activity, in particular NO_x, SO_2 and NH_3.

2. Photochemical ozone creation potential:

The life-cycle emissions of pollutants contributing to the photochemical ozone creation potential are lower than **0.05** kg C2H2 eq per 1 MWh of electricity output to the power grid or to directly connected customers. The calculation of the photochemical ozone creation potential includes all pollutants relevant for the activity, in particular CO, NOx and relevant VOCs.

3. Eutrophication potential:

The life-cycle emissions of pollutants contributing to the photochemical ozone creation potential are lower than **0.05** kg PO43- eq per 1 MWh of electricity output to the power grid or to directly connected customers. The calculation of the eutrophication potential includes all pollutants relevant for the activity, in particular NO_x, NH_4^+, N, PO_4^{3-}, P and COD (chemical oxygen demand).

4. Particulate matter PM10:

The life-cycle emissions of PM10 are lower than **0.05** kg/per 1 MWh of electricity output to the power grid or to directly connected customers.

5. Fine particulate matter PM2.5:

The life-cycle emissions of PM10 are lower than **0.02** kg/per 1 MWh of electricity output to the power grid or to directly connected customers.

6. Activity-specific criteria:

Emissions are within or lower than the emission levels associated with the best available techniques (**BAT-AEL**) ranges set out in the latest relevant best available techniques (BAT) conclusions, including the best available techniques (BAT) conclusions for **large combustion plants**[361]. **No significant cross-media effects occur.**

For combustion plants with thermal input greater than 1 MW but below the thresholds for the BAT conclusions for large combustion plants to apply, emissions are below the emission limit values set out in Annex II, part 2, to Directive (EU) 2015/2193 of the European Parliament and of the Council[362].

Methodology for calculation of criterion 1. Acidification potential, 2. Photochemical ozone creation and 3. Eutrophication based on one of the following:

- Life-cycle environmental impacts are calculated using Commission Recommendation 2013/179/EU or, alternatively, using ISO 14025:2010 and ISO 14040:2006 and ISO 14044:2006. Lifecycle environmental impacts are third party verified in according with the procedure described in ISO 14044.

Do no significant harm ('DNSH')

(1) Climate change mitigation	*This criterion is not in the scope of this call for feedback.*
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.

[361] Commission Implementing Decision (EU) 2017/1442 of 31 July 2017 establishing best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for large combustion plants (OJ L 212, 17.8.2017, p. 1).

[362] Directive (EU) 2015/2193 of the European Parliament and of the Council of 25 November 2015 on the limitation of emissions of certain pollutants into the air from **medium combustion plants** (OJ L 313, 28.11.2015, p. 1).

(3) Sustainable use and protection of water and marine resources	DNSH as set out in Appending B of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.
(4) Transition to circular economy	The activity assesses availability of and, where feasible, uses equipment and components of high durability and recyclability and that are easy to dismantle and refurbish.
(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appending D of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.

Rationale

On the choice of activities (i.e. different technologies) for power generation

The selection includes **activities** for which the conducted analysis shows that they are **in principle capable of fulfilling the proposed TSC**. Depending on the pending decision which SC threshold is selected for the Acidification Potential, not for all proposed activities, evidence was found that they could fulfil the TSC; however, due the available data for life-cycle pollutant emissions are limited, so when in doubt, the activities in question were included in the proposal (e.g. power from geothermal energy).

Nevertheless, other activities (technologies) are not included in the proposal. Power generation using liquid fuels (oil) and biomass were not included because the available data range showed their performance concerning the pollution objective is, by far, insufficient to achieve with the proposed SC thresholds. Therefore it appears unrealistic that currently any aligned assets exist that could be invested in. Hence, these activities are not proposed for the taxonomy.

Both combined heat and power generation (**CHP, cogeneration**) and power generation without heat utilisation are included.

On the criteria for substantial contribution (SC)

For all power generation activities, the same **overarching thresholds for five pollution criteria** are proposed. They address the most significant air pollutant emissions resulting from these activities in the European Union at present. These five criteria cover **life-cycle** emissions, i.e. the value chain until the generated power is delivered to the grid (or to directly connected customers), which includes direct emissions during electricity generation and indirection emissions from upstream stages (fuel production and transport), construction of the power generation facilities and production of the required components.

For **some of the activities, additional criteria** are proposed, to account for environmental specificities of the activity, or to ensure that EU legal requirements, which apply to direct instead life-cycle emissions, are also fulfilled. (These were taken from the DA Climate change mitigation criteria for DNSH concerning the Pollution objective of these activities.)

The proposed **SC threshold levels** result from the analysis of life-cycle pollution data from scientific publications and recent Environmental Product Declarations (EPDs), covering power generation using different technologies.

In the available data sources, the pollutants are either reported by substance (e.g. NOx, SO2, …) or partly combined to **metrics per type of environmental impact** (e.g. the acidification potential, which covers NOx and SO2 and, depending on the methodology, some further acidifying substances which are emitted at lower levels in power generation).

The proposed criteria use the approach of grouping pollutants based on their environmental impact. This choice allows for a lower number of criteria and is already applied in the market, for example due to its application in the EPD methodology for power generation.

The methodology for splitting the emissions between the power output and the heat output, which is required because only the power output of the **CHP** plants is covered by the activities, is proposed in analogy to the Annex II of the Energy Efficiency Directive.

Rationale for choosing the proposed SC criteria and thresholds:

1. Acidification potential (kg SO2 eq per MWh)

Includes SO2 and NOx (and depending on methodology, further pollutants)

Very significant parameter because current emissions from electricity generation are very high. The proposed conversion factors are based on Hauschild & Wenzel, 1998.

Pending decision on the threshold level of Acidification potential:

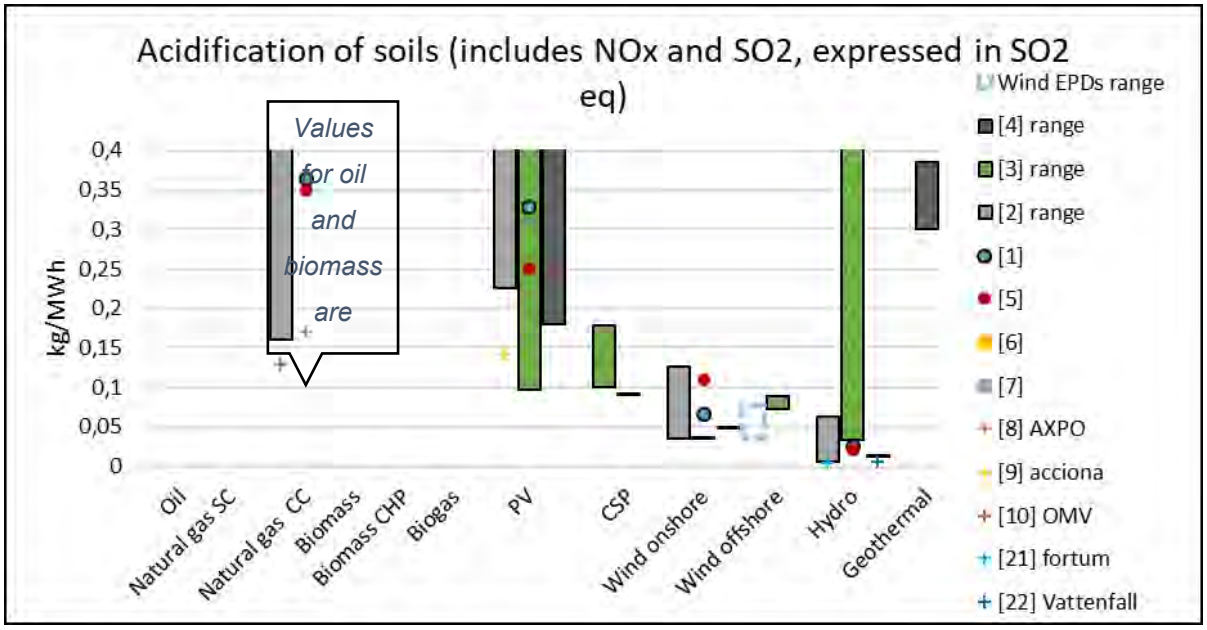
Threshold Options (all expressed in kg SO2 eq per MWh):

a) 0.05

b) 0.15

c) 0.10

The result of the data analysis is shown in the following chart, the arguments for each of the three threshold levels are presented after the chart.



[1] to [7] represent data from scientific publications (filled circles and range bars), [8]-22] represent EPDs (with [11-20] wind power EPDs shown as blue dashed range), [10] Represents NOx and SOx data from emission compliance monitoring & measurement from the power plant and internally calculated pollution data (NOx/SOx) from upstream gas field operation (based on officially reported fuel consumption for gas field operation) from the fuel provision part.

Arguments for the three threshold options:

a) 0.05

This threshold is achieved by a part of literature data (representing somewhat older data) and part of recent wind plant data as well as all recent and part of older hydropower; (currently) not achieved by PV/CSP, geothermal and natural gas.

Arguments in favour of this threshold:

- Pro:
  Evidence is robust that it is possible to generate power by wind power and hydropower at this performance level (i.e. the threshold does not represent a single best performing plant, but is achieved by a range of plants, as shown by different literature sources and recent EPDs).

- Pro:
  This is the most ambitious threshold choice. The PSFs Headline Ambition Level for the Objective “Pollution Prevention and Control” sets 2030 as the target year for preventing and eliminating pollution. Power plants and infrastructure have a long lifetime, roughly 30 – 100 years. So the current criteria proposals will cover physical infrastructure which will still be largely in operation by 2030 and thus is relevant for achieving the 2030 target. Based on the assessment carried out, it is not possible to fully prevent or eliminate pollution for power generation. However, by this threshold choice, the taxonomy highlights the strongest (currently possible) contributing performing activities to the Headline Ambition.

- Pro:
  In the area of pollution, the Green Deals is very ambitions and specifies “Zero Pollution” at the EU’s target. Likewise, the EC recently published the “Zero pollution action plan”. Therefore is appropriate to set the pollution threshold in the taxonomy, which is a voluntary and transparency instrument, to the most ambitions threshold choice.

- Pro:
  This level is achievable by wind onshore, wind offshore and hydropower, thus not limited to a single technology. (Possibly also soon achievable by PV/CSP due to rapid technology development and reduction of coal-related pollution in power generation for component production process.)

- Pro:
  To set this threshold, for which in none of the activities (technologies) every plant achieves this level, gives incentives to some activities to improve.

b) 0.15

This threshold is achieved by all of analysed wind energy data, most hydropower (all of the recent EPDs), CSP and the best PV and the best performing gas (CC gas plants).

Arguments in favour of this threshold:

- Pro:
  This level can be achieved by more technologies, e.g. best-performing gas power plants, therefore more assets included

- Pro:
  The initial Ramboll study has assessed a high improvement opportunity for the sector energy production and distribution. Identified improvement opportunities for achieving high improvement potential are related to technical and (post-)combustion modification and NOx/SOx removal processes. Having the acidification threshold set at 0.15 would give the opportunity for high performing CCGT with low pollution impact from upstream fuel provision to deliver substantial positive environmental impact on the basis of life-cycle considerations.

- Pro:
  It gives incentives for gas power plants (CCGT: combined-cycle gas turbine) and gas-fired CHP, so they reduce their pollution, in a way that they could contribute to EU objectives.

On the proposed, possible option of exempting wind power from demonstrating SC in case of the threshold level of 0.15:

At this threshold level, wind power could be exempted from proving threshold compliance, because based on the analysed data, it appears that all wind power will achieve this performance level.

c) 0.10

This threshold is achieved by all of recent wind energy (EPD) and all of recent hydropower data (EPDs, they are existing/old power plants); some CSP and some of PV (1 recent plant not), not by gas.

Arguments in favour of this threshold:

- Pro: “compromise solution” between 0.05 and 0.15.

2. Photochemical ozone creation potential: **0.05** kg C2H2 eq per MWh

The proposed threshold is achieved by geothermal, hydro (except 1 source), wind, CSP, most PV, partly by biomass, most natural gas CC.

This parameter covers in particular CO, NOx and VOCs (volatile organic compounds). VOCs are classified into the following categories: alkanes, halogenated HCs, alcohols, ketones, esters, ethers, olefins,

acetylenes, aromatics and aldehydes.

3. Eutrophication potential: **0.05** kg PO43- eq per MWh

The proposed threshold is for PV possible to achieve, achieved by most hydro, achieved by all wind and geothermal as well as CSP; partly achieved by gas CC and PV. The proposed conversion factors are based on Heijungs et al. (1992).

4. PM10: **0.05** kg/per MWh

The proposed threshold is achieved by all wind, all hydro, most gas CC, all EPDs plants.

5. PM2.5: **0.02** kg/per MWh

The proposed threshold is achieved by almost all wind, all hydro, PV most recent data, gas CC.

6. Activity-specific criteria

These parameters, which have been set for DNSH for some of these activities in the Delegated act on climate change mitigation, dealing with specific issues only relevant for certain technologies (e.g. anti-fouling paint and biocides for ocean energy technologies), or to ensure current EU legal minimum environmental performance (e.g. for direct emissions, achieving the BAT-AEL ranges where applicable), **are proposed in addition to the five common overarching SC criteria**.

In the case of power generation from natural gas, the criteria from the activity "4.7 Electricity generation from renewable non-fossil gaseous and liquid fuels" of the climate change mitigation DA were used, because they cover the same legislation that also applies to natural gas-fired power plants (BAT, Medium combustion plant directive).

Pollutants considered, but not included in proposal

Metals and metalloids (As, Cd, Pb; Hg) and PAH: would have been relevant for biomass, but power generation is not proposed as an activity for other reasons (see above); poor data availability for life-cycle emissions of these pollutants was noted.

Sources

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3.10 Electricity generation from renewable non-fossil gaseous fuels

Description of the activity

Construction or operation of electricity generation facilities that produce electricity using gaseous of renewable origin. This activity does not include electricity generation from the exclusive use of biogas (see Section 4.8 of this Annex). (as in 4.7 Climate change mitigation DA, but without liquid fuels)

The economic activities in this category could be associated with several NACE codes, in particular D35.11 [Production of electricity] and F42.22 [Construction of utility projects for electricity and telecommunications] in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006. (as in Climate change mitigation DA)

Substantial contribution to pollution prevention and control

The activity complies with all of the following criteria:

1. Acidification potential

Pending decision on the threshold level (see Rationale for details):

Threshold Options:

The life-cycle emissions of pollutants contributing to the acidification potential are lower than…

- **0.05**
- **0.15** (possible exemption: wind power does not have to demonstrate achievement of this threshold)
- **0.10**

… kg SO_2 eq per 1 MWh of electricity output to the power grid or to directly connected customers. The calculation of the acidification potential includes all pollutants relevant for the activity, in particular NO_x, SO_2 and NH_3.

2. Photochemical ozone creation potential:

The life-cycle emissions of pollutants contributing to the photochemical ozone creation potential are lower than **0.05** kg C2H2 eq per 1 MWh of electricity output to the power grid or to directly connected customers. The calculation of the photochemical ozone creation potential includes all pollutants relevant for the activity, in particular CO, NOx and relevant VOCs.

3. Eutrophication potential:

The life-cycle emissions of pollutants contributing to the photochemical ozone creation potential are lower than **0.05** kg PO43- eq per 1 MWh of electricity output to the power grid or to directly connected customers. The calculation of the eutrophication potential includes all pollutants relevant for the activity, in particular NO_x, NH_4^+, N, PO_4^{3-}, P and COD (chemical oxygen demand).

4. Particulate matter PM10:

The life-cycle emissions of PM10 are lower than **0.05** kg/per 1 MWh of electricity output to the power grid or to directly connected customers.

5. Fine particulate matter PM2.5:

The life-cycle emissions of PM10 are lower than **0.02** kg/per 1 MWh of electricity output to the power grid or to directly connected customers.

6. Activity-specific criteria:

Emissions are within or lower than the emission levels associated with the best available techniques (**BAT-AEL**) ranges set out in the latest relevant best available techniques (BAT) conclusions, including the best available techniques (BAT) conclusions for **large combustion plants**[363]. **No significant cross-media effects occur.**

For combustion plants with thermal input greater than 1 MW but below the thresholds for the BAT conclusions for large combustion plants to apply, emissions are below the emission limit values set out in Annex II, part 2, to Directive (EU) 2015/2193 of the European Parliament and of the Council[364].

Methodology for calculation of criterion 1. Acidification potential, 2. Photochemical ozone creation and 3. Eutrophication based on one of the following:

- Life-cycle environmental impacts are calculated using Commission Recommendation 2013/179/EU or, alternatively, using ISO 14025:2010 and ISO 14040:2006 and ISO 14044:2006. Lifecycle environmental impacts are third party verified in according with the procedure described in ISO 14044.

Do no significant harm ('DNSH')

[363] Commission Implementing Decision (EU) 2017/1442 of 31 July 2017 establishing best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for large combustion plants (OJ L 212, 17.8.2017, p. 1).

[364] Directive (EU) 2015/2193 of the European Parliament and of the Council of 25 November 2015 on the limitation of emissions of certain pollutants into the air from **medium combustion plants** (OJ L 313, 28.11.2015, p. 1).

(1) Climate change mitigation	*This criterion is not in the scope of this call for feedback.*
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.
(3) Sustainable use and protection of water and marine resources	DNSH as set out in Appending B of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.
(4) Transition to circular economy	N/A
(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appending D of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.

Rationale

On the choice of activities (i.e. different technologies) for power generation

The selection includes **activities** for which the conducted analysis shows that they are **in principle capable of fulfilling the proposed TSC**. Depending on the pending decision which SC threshold is selected for the Acidification Potential, not for all proposed activities, evidence was found that they could fulfil the TSC; however, due the available data for life-cycle pollutant emissions are limited, so when in doubt, the activities in question were included in the proposal (e.g. power from geothermal energy).

Nevertheless, other activities (technologies) are not included in the proposal. Power generation using liquid fuels (oil) and biomass were not included because the available data range showed their performance concerning the pollution objective is, by far, insufficient to achieve with the proposed SC thresholds. Therefore it appears unrealistic that currently any aligned assets exist that could be invested in. Hence, these activities are not proposed for the taxonomy.

Both combined heat and power generation (**CHP, cogeneration**) and power generation without heat utilisation are included.

On the criteria for substantial contribution (SC)

For all power generation activities, the same **overarching thresholds for five pollution criteria** are proposed. They address the most significant air pollutant emissions resulting from these activities in the European Union at present. These five criteria cover **life-cycle** emissions, i.e. the value chain until the generated power is delivered to the grid (or to directly connected customers), which includes direct emissions during electricity generation and indirection emissions from upstream stages (fuel production and transport), construction of the power generation facilities and production of the required components.

For **some of the activities, additional criteria** are proposed, to account for environmental specificities of the activity, or to ensure that EU legal requirements, which apply to direct instead life-cycle emissions, are also fulfilled. (These were taken from the DA Climate change mitigation criteria for DNSH concerning the Pollution objective of these activities.)

The proposed **SC threshold levels** result from the analysis of life-cycle pollution data from scientific publications and recent Environmental Product Declarations (EPDs), covering power generation using different technologies.

In the available data sources, the pollutants are either reported by substance (e.g. NOx, SO2, …) or partly combined to **metrics per type of environmental impact** (e.g. the acidification potential, which covers NOx and SO2 and, depending on the methodology, some further acidifying substances which are emitted at lower levels in power generation).

The proposed criteria use the approach of grouping pollutants based on their environmental impact. This choice allows for a lower number of criteria and is already applied in the market, for example due to its application in the EPD methodology for power generation.

The methodology for splitting the emissions between the power output and the heat output, which is required because only the power output of the **CHP** plants is covered by the activities, is proposed in analogy to the Annex II of the Energy Efficiency Directive.

Rationale for choosing the proposed SC criteria and thresholds:

1. Acidification potential (kg SO2 eq per MWh)

Includes SO2 and NOx (and depending on methodology, further pollutants)

Very significant parameter because current emissions from electricity generation are very high. The proposed conversion factors are based on Hauschild & Wenzel, 1998.

Pending decision on the threshold level of Acidification potential:

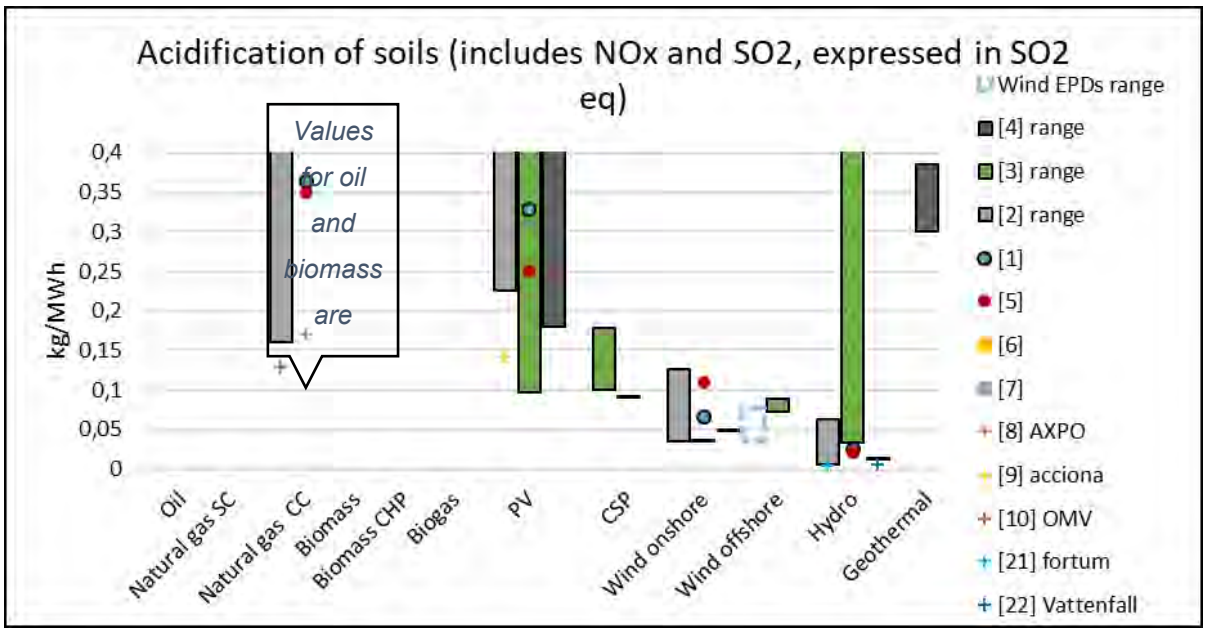
Threshold Options (all expressed in kg SO2 eq per MWh):

a) 0.05

b) 0.15

c) 0.10

The result of the data analysis is shown in the following chart, the arguments for each of the three threshold levels are presented after the chart.



[1] to [7] represent data from scientific publications (filled circles and range bars), [8]-22] represent EPDs (with [11-20] wind power EPDs shown as blue dashed range), [10] Represents NOx and SOx data from emission compliance monitoring & measurement from the power plant and internally calculated pollution data (NOx/SOx) from upstream gas field operation (based on officially reported fuel consumption for gas field operation) from the fuel provision part.

Arguments for the three threshold options:

a) 0.05

This threshold is achieved by a part of literature data (representing somewhat older data) and part of recent wind plant data as well as all recent and part of older hydropower; (currently) not achieved by PV/CSP, geothermal and natural gas.

Arguments in favour of this threshold:

- Pro:
  Evidence is robust that it is possible to generate power by wind power and hydropower at this performance level (i.e. the threshold does not represent a single best performing plant, but is achieved by a range of plants, as shown by different literature sources and recent EPDs).

- Pro:
  This is the most ambitious threshold choice. The PSFs Headline Ambition Level for the Objective “Pollution Prevention and Control” sets 2030 as the target year for preventing and eliminating pollution. Power plants and infrastructure have a long lifetime, roughly 30 – 100 years. So the current criteria proposals will cover physical infrastructure which will still be largely in operation by 2030 and thus is relevant for achieving the 2030 target. Based on the assessment carried out, it is not possible to fully prevent or eliminate pollution for power generation. However, by this threshold choice, the taxonomy highlights the strongest (currently possible) contributing performing activities to the Headline Ambition.

- Pro:
  In the area of pollution, the Green Deals is very ambitions and specifies “Zero Pollution” at the EU’s target. Likewise, the EC recently published the “Zero pollution action plan”. Therefore is appropriate to set the pollution threshold in the taxonomy,

which is a voluntary and transparency instrument, to the most ambitions threshold choice.

- Pro:
  This level is achievable by wind onshore, wind offshore and hydropower, thus not limited to a single technology. (Possibly also soon achievable by PV/CSP due to rapid technology development and reduction of coal-related pollution in power generation for component production process.)

- Pro:
  To set this threshold, for which in none of the activities (technologies) every plant achieves this level, gives incentives to some activities to improve.

b) 0.15

This threshold is achieved by all of analysed wind energy data, most hydropower (all of the recent EPDs), CSP and the best PV and the best performing gas (CC gas plants).

Arguments in favour of this threshold:

- Pro:
  This level can be achieved by more technologies, e.g. best-performing gas power plants, therefore more assets included

- Pro:
  The initial Ramboll study has assessed a high improvement opportunity for the sector energy production and distribution. Identified improvement opportunities for achieving high improvement potential are related to technical and (post-)combustion modification and NOx/SOx removal processes. Having the acidification threshold set at 0.15 would give the opportunity for high performing CCGT with low pollution impact from upstream fuel provision to deliver substantial positive environmental impact on the basis of life-cycle considerations.

- Pro:
  It gives incentives for gas power plants (CCGT: combined-cycle gas turbine) and gas-

fired CHP, so they reduce their pollution, in a way that they could contribute to EU objectives.

On the proposed, possible option of exempting wind power from demonstrating SC in case of the threshold level of 0.15:

At this threshold level, wind power could be exempted from proving threshold compliance, because based on the analysed data, it appears that all wind power will achieve this performance level.

c) 0.10

This threshold is achieved by all of recent wind energy (EPD) and all of recent hydropower data (EPDs, they are existing/old power plants); some CSP and some of PV (1 recent plant not), not by gas.

Arguments in favour of this threshold:

- Pro: “compromise solution” between 0.05 and 0.15.

2. Photochemical ozone creation potential: **0.05** kg C2H2 eq per MWh

The proposed threshold is achieved by geothermal, hydro (except 1 source), wind, CSP, most PV, partly by biomass, most natural gas CC.

This parameter covers in particular CO, NOx and VOCs (volatile organic compounds). VOCs are classified into the following categories: alkanes, halogenated HCs, alcohols, ketones, esters, ethers, olefins,

acetylenes, aromatics and aldehydes.

3. Eutrophication potential: **0.05** kg PO43- eq per MWh

The proposed threshold is for PV possible to achieve, achieved by most hydro, achieved by all wind and geothermal as well as CSP; partly achieved by gas CC and PV. The proposed conversion factors are based on Heijungs et al. (1992).

4. PM10: **0.05** kg/per MWh

The proposed threshold is achieved by all wind, all hydro, most gas CC, all EPDs plants.

5. PM2.5: **0.02** kg/per MWh

The proposed threshold is achieved by almost all wind, all hydro, PV most recent data, gas CC.

6. Activity-specific criteria

These parameters, which have been set for DNSH for some of these activities in the Delegated act on climate change mitigation, dealing with specific issues only relevant for certain technologies (e.g. anti-fouling paint and biocides for ocean energy technologies), or to ensure current EU legal minimum environmental performance (e.g. for direct emissions, achieving the BAT-AEL ranges where applicable), **are proposed in addition to the five common overarching SC criteria**.

In the case of power generation from natural gas, the criteria from the activity "4.7 Electricity generation from renewable non-fossil gaseous and liquid fuels" of the climate change mitigation DA were used, because they cover the same legislation that also applies to natural gas-fired power plants (BAT, Medium combustion plant directive).

Pollutants considered, but not included in proposal

Metals and metalloids (As, Cd, Pb; Hg) and PAH: would have been relevant for biomass, but power generation is not proposed as an activity for other reasons (see above); poor data availability for life-cycle emissions of these pollutants was noted.

Sources

[1] Rentizelas A, Georgakellos D. Incorporating life cycle external cost in optimization of the electricity generation mix. Energy Policy 2014;65:134–49. https://doi.org/10.1016/j.enpol.2013.10.023.

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3.11 Electricity generation from biogas

Description of the activity

Construction and operation of electricity generation installations that produce electricity exclusively from biogas, excluding electricity generation from blending of renewable fuels with

biogas (see Section 4.7 of this Annex). (as in 4.8 Climate change mitigation DA, but without bioliquids and biomass)

The economic activities in this category could be associated with several NACE codes, in particular D35.11 [Production of electricity] and F42.22 [Construction of utility projects for electricity and telecommunications] in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006. (as in Climate change mitigation DA)

Substantial contribution to pollution prevention and control

The activity complies with all of the following criteria:

1. Acidification potential

Pending decision on the threshold level (see Rationale for details):

Threshold Options:

The life-cycle emissions of pollutants contributing to the acidification potential are lower than…

- **0.05**
- **0.15** (possible exemption: wind power does not have to demonstrate achievement of this threshold)
- **0.10**

… kg SO_2 eq per 1 MWh of electricity output to the power grid or to directly connected customers. The calculation of the acidification potential includes all pollutants relevant for the activity, in particular NO_x, SO_2 and NH_3.

2. Photochemical ozone creation potential:

The life-cycle emissions of pollutants contributing to the photochemical ozone creation potential are lower than **0.05** kg C2H2 eq per 1 MWh of electricity output to the power grid or to directly connected customers. The calculation of the photochemical ozone creation potential includes all pollutants relevant for the activity, in particular CO, NOx and relevant VOCs.

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3. Eutrophication potential:

The life-cycle emissions of pollutants contributing to the photochemical ozone creation potential are lower than **0.05** kg PO43- eq per 1 MWh of electricity output to the power grid or to directly connected customers. The calculation of the eutrophication potential includes all pollutants relevant for the activity, in particular NO_x, NH_4^+, N, PO_4^{3-}, P and COD (chemical oxygen demand).

4. Particulate matter PM10:

The life-cycle emissions of PM10 are lower than **0.05** kg/per 1 MWh of electricity output to the power grid or to directly connected customers.

5. Fine particulate matter PM2.5:

The life-cycle emissions of PM10 are lower than **0.02** kg/per 1 MWh of electricity output to the power grid or to directly connected customers.

6. Activity-specific criteria:

For installations falling within the scope of Directive 2010/75/EU of the European Parliament and of the Council[365], emissions are within or lower than the emission levels associated with the best available techniques (**BAT-AEL**) ranges set out in the latest relevant best available techniques (BAT) conclusions, including the best available techniques (BAT) conclusions for large combustion plants[366]. **No significant cross-media effects occur**.

For combustion plants with thermal input greater than 1 MW but below the thresholds for the BAT conclusions for large combustion plants to apply, emissions are below the emission limit values set out in Annex II, part 2, to **Directive (EU) 2015/2193**.

For plants in zones or parts of zones not complying with the air quality limit values laid down in Directive 2008/50/EC, measures are implemented to reduce emission levels taking into account the results of the information exchange[367] which are published by the Commission in accordance with Article 6, paragraphs 9 and 10, of Directive (EU) 2015/2193 .

For **anaerobic digestion** of organic material, where the produced digestate is used as fertiliser or soil improver, either directly or after composting or any other treatment, it meets the **requirements for fertilising materials** set out in Component Material Categories (CMC) 4

and 5 in Annex II to Regulation (EU) 2019/1009 or national rules on fertilisers or soil improvers for agricultural use.

For anaerobic digestion plants treating over 100 tonnes per day, **emissions to air and water** are within or lower than the emission levels associated with the best available techniques (BAT-AEL) ranges set for anaerobic treatment of waste in the latest relevant best available techniques (BAT) conclusions, including the best available techniques (BAT) conclusions **for waste treatment**[368]. No significant cross-media effects occur.

Methodology for calculation of criterion 1. Acidification potential, 2. Photochemical ozone creation and 3. Eutrophication based on one of the following:

- Life-cycle environmental impacts are calculated using Commission Recommendation 2013/179/EU or, alternatively, using ISO 14025:2010 and ISO 14040:2006 and ISO 14044:2006. Lifecycle environmental impacts are third party verified in according with the procedure described in ISO 14044.

Do no significant harm ('DNSH')

(1) Climate change mitigation	*This criterion is not in the scope of this call for feedback.*

[365] Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control) (OJ L 334, 17.12.2010, p. 17).

[366] Implementing Decision (EU) 2017/1442.

[367] The final technology report resulting from the exchange of information with Member States, the industries concerned and non-governmental organisations contains technical information on best available technologies used in medium combustion plants to reduce their environmental impacts, and on the emission levels achievable with best available and emerging technologies and the related costs (version of [adoption date]: https://circabc.europa.eu/ui/group/06f33a94-9829-4eee-b187-21bb783a0fbf/library/9a99a632-9ba8-4cc0-9679-08d929afda59/details).

[368] Commission Implementing Decision (EU) 2018/1147 of 10 August 2018 establishing best available techniques (BAT) conclusions for waste treatment, under Directive 2010/75/EU of the European Parliament and of the Council (OJ L 208, 17.8.2018, p. 38).

(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.
(3) Sustainable use and protection of water and marine resources	DNSH as set out in Appending B of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.
(4) Transition to circular economy	N/A
(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appending D of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.

Rationale

On the choice of activities (i.e. different technologies) for power generation

The selection includes **activities** for which the conducted analysis shows that they are **in principle capable of fulfilling the proposed TSC**. Depending on the pending decision which SC threshold is selected for the Acidification Potential, not for all proposed activities, evidence was found that they could fulfil the TSC; however, due the available data for life-cycle pollutant emissions are limited, so when in doubt, the activities in question were included in the proposal (e.g. power from geothermal energy).

Nevertheless, other activities (technologies) are not included in the proposal. Power generation using liquid fuels (oil) and biomass were not included because the available data range showed their performance concerning the pollution objective is, by far, insufficient to achieve with the

proposed SC thresholds. Therefore it appears unrealistic that currently any aligned assets exist that could be invested in. Hence, these activities are not proposed for the taxonomy.

Both combined heat and power generation (**CHP, cogeneration**) and power generation without heat utilisation are included.

On the criteria for substantial contribution (SC)

For all power generation activities, the same **overarching thresholds for five pollution criteria** are proposed. They address the most significant air pollutant emissions resulting from these activities in the European Union at present. These five criteria cover **life-cycle** emissions, i.e. the value chain until the generated power is delivered to the grid (or to directly connected customers), which includes direct emissions during electricity generation and indirection emissions from upstream stages (fuel production and transport), construction of the power generation facilities and production of the required components.

For **some of the activities, additional criteria** are proposed, to account for environmental specificities of the activity, or to ensure that EU legal requirements, which apply to direct instead life-cycle emissions, are also fulfilled. (These were taken from the DA Climate change mitigation criteria for DNSH concerning the Pollution objective of these activities.)

The proposed **SC threshold levels** result from the analysis of life-cycle pollution data from scientific publications and recent Environmental Product Declarations (EPDs), covering power generation using different technologies.

In the available data sources, the pollutants are either reported by substance (e.g. NOx, SO2, …) or partly combined to **metrics per type of environmental impact** (e.g. the acidification potential, which covers NOx and SO2 and, depending on the methodology, some further acidifying substances which are emitted at lower levels in power generation).

The proposed criteria use the approach of grouping pollutants based on their environmental impact. This choice allows for a lower number of criteria and is already applied in the market, for example due to its application in the EPD methodology for power generation.

The methodology for splitting the emissions between the power output and the heat output, which is required because only the power output of the **CHP** plants is covered by the activities, is proposed in analogy to the Annex II of the Energy Efficiency Directive.

Rationale for choosing the proposed SC criteria and thresholds:

1. Acidification potential (kg SO2 eq per MWh)

Includes SO2 and NOx (and depending on methodology, further pollutants)

Very significant parameter because current emissions from electricity generation are very high. The proposed conversion factors are based on Hauschild & Wenzel, 1998.

Pending decision on the threshold level of Acidification potential:

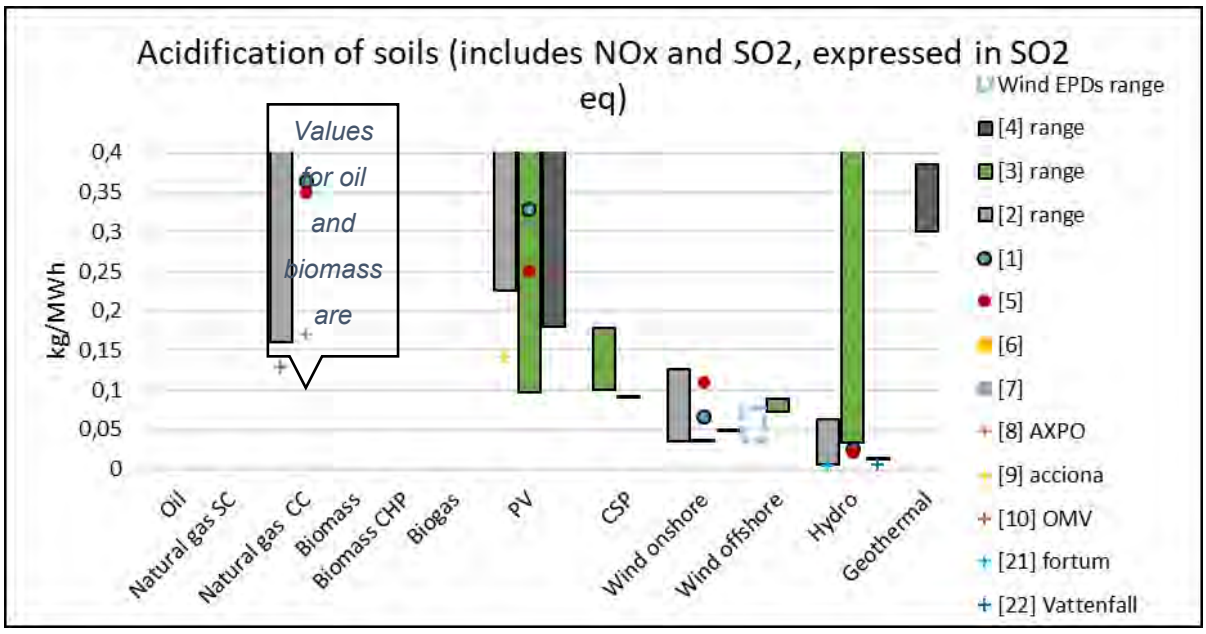
Threshold Options (all expressed in kg SO2 eq per MWh):

a) 0.05

b) 0.15

c) 0.10

The result of the data analysis is shown in the following chart, the arguments for each of the three threshold levels are presented after the chart.



[1] to [7] represent data from scientific publications (filled circles and range bars), [8]-22] represent EPDs (with [11-20] wind power EPDs shown as blue dashed range), [10] Represents NOx and SOx data from emission compliance monitoring & measurement from the power plant

and internally calculated pollution data (NOx/SOx) from upstream gas field operation (based on officially reported fuel consumption for gas field operation) from the fuel provision part.

Arguments for the three threshold options:

a) 0.05

This threshold is achieved by a part of literature data (representing somewhat older data) and part of recent wind plant data as well as all recent and part of older hydropower; (currently) not achieved by PV/CSP, geothermal and natural gas.

Arguments in favour of this threshold:

- Pro:
  Evidence is robust that it is possible to generate power by wind power and hydropower at this performance level (i.e. the threshold does not represent a single best performing plant, but is achieved by a range of plants, as shown by different literature sources and recent EPDs).

- Pro:
  This is the most ambitious threshold choice. The PSFs Headline Ambition Level for the Objective “Pollution Prevention and Control” sets 2030 as the target year for preventing and eliminating pollution. Power plants and infrastructure have a long lifetime, roughly 30 – 100 years. So the current criteria proposals will cover physical infrastructure which will still be largely in operation by 2030 and thus is relevant for achieving the 2030 target. Based on the assessment carried out, it is not possible to fully prevent or eliminate pollution for power generation. However, by this threshold choice, the taxonomy highlights the strongest (currently possible) contributing performing activities to the Headline Ambition.

- Pro:
  In the area of pollution, the Green Deals is very ambitions and specifies “Zero Pollution” at the EU’s target. Likewise, the EC recently published the “Zero pollution action plan”. Therefore is appropriate to set the pollution threshold in the taxonomy, which is a voluntary and transparency instrument, to the most ambitions threshold choice.

- Pro:
  This level is achievable by wind onshore, wind offshore and hydropower, thus not limited to a single technology. (Possibly also soon achievable by PV/CSP due to rapid technology development and reduction of coal-related pollution in power generation for component production process.)

- Pro:
  To set this threshold, for which in none of the activities (technologies) every plant achieves this level, gives incentives to some activities to improve.

b) 0.15

This threshold is achieved by all of analysed wind energy data, most hydropower (all of the recent EPDs), CSP and the best PV and the best performing gas (CC gas plants).

Arguments in favour of this threshold:

- Pro:
  This level can be achieved by more technologies, e.g. best-performing gas power plants, therefore more assets included

- Pro:
  The initial Ramboll study has assessed a high improvement opportunity for the sector energy production and distribution. Identified improvement opportunities for achieving high improvement potential are related to technical and (post-)combustion modification and NOx/SOx removal processes. Having the acidification threshold set at 0.15 would give the opportunity for high performing CCGT with low pollution impact from upstream fuel provision to deliver substantial positive environmental impact on the basis of life-cycle considerations.

- Pro:
  It gives incentives for gas power plants (CCGT: combined-cycle gas turbine) and gas-fired CHP, so they reduce their pollution, in a way that they could contribute to EU objectives.

On the proposed, possible option of exempting wind power from demonstrating SC in case of the threshold level of 0.15:

At this threshold level, wind power could be exempted from proving threshold compliance, because based on the analysed data, it appears that all wind power will achieve this performance level.

c) 0.10

This threshold is achieved by all of recent wind energy (EPD) and all of recent hydropower data (EPDs, they are existing/old power plants); some CSP and some of PV (1 recent plant not), not by gas.

Arguments in favour of this threshold:

- Pro: “compromise solution” between 0.05 and 0.15.

2. Photochemical ozone creation potential: **0.05** kg C2H2 eq per MWh

The proposed threshold is achieved by geothermal, hydro (except 1 source), wind, CSP, most PV, partly by biomass, most natural gas CC.

This parameter covers in particular CO, NOx and VOCs (volatile organic compounds). VOCs are classified into the following categories: alkanes, halogenated HCs, alcohols, ketones, esters, ethers, olefins,

acetylenes, aromatics and aldehydes.

3. Eutrophication potential: **0.05** kg PO43- eq per MWh

The proposed threshold is for PV possible to achieve, achieved by most hydro, achieved by all wind and geothermal as well as CSP; partly achieved by gas CC and PV. The proposed conversion factors are based on Heijungs et al. (1992).

4. PM10: **0.05** kg/per MWh

The proposed threshold is achieved by all wind, all hydro, most gas CC, all EPDs plants.

5. PM2.5: **0.02** kg/per MWh

The proposed threshold is achieved by almost all wind, all hydro, PV most recent data, gas CC.

6. Activity-specific criteria

These parameters, which have been set for DNSH for some of these activities in the Delegated act on climate change mitigation, dealing with specific issues only relevant for certain technologies (e.g. anti-fouling paint and biocides for ocean energy technologies), or to ensure current EU legal minimum environmental performance (e.g. for direct emissions, achieving the BAT-AEL ranges where applicable), **are proposed in addition to the five common overarching SC criteria**.

In the case of power generation from natural gas, the criteria from the activity "4.7 Electricity generation from renewable non-fossil gaseous and liquid fuels" of the climate change mitigation DA were used, because they cover the same legislation that also applies to natural gas-fired power plants (BAT, Medium combustion plant directive).

Pollutants considered, but not included in proposal

Metals and metalloids (As, Cd, Pb; Hg) and PAH: would have been relevant for biomass, but power generation is not proposed as an activity for other reasons (see above); poor data availability for life-cycle emissions of these pollutants was noted.

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[12] 2019 EPD Vattenfall wind summary https://portal.environdec.com/api/api/v1/EPDLibrary/Files/644762eb-c06e-433f-a6e8-a695e54f72fe/Data

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3.12 Power from cogeneration of heat/cool and power from solar energy

Description of the activity

Construction and operation of facilities co-generating electricity and heat/cool from solar energy. (as in 4.17 Cogeneration of heat/cool and power from solar energy in Climate change mitigation DA, but limited to power)

The activity is classified under NACE code D35.11 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006

Substantial contribution to pollution prevention and control

The activity complies with all of the following criteria:

1. Acidification potential

Pending decision on the threshold level (see Rationale for details):

Threshold Options:

The life-cycle emissions of pollutants contributing to the acidification potential are lower than…

- **0.05**
- **0.15** (possible exemption: wind power does not have to demonstrate achievement of this threshold)
- **0.10**

… kg SO_2 eq per 1 MWh of electricity output to the power grid or to directly connected customers. The calculation of the acidification potential includes all pollutants relevant for the activity, in particular NO_x, SO_2 and NH_3.

2. Photochemical ozone creation potential:

The life-cycle emissions of pollutants contributing to the photochemical ozone creation potential are lower than **0.05** kg C2H2 eq per 1 MWh of electricity output to the power grid or to directly connected customers. The calculation of the photochemical ozone creation potential includes all pollutants relevant for the activity, in particular CO, NOx and relevant VOCs.

3. Eutrophication potential:

The life-cycle emissions of pollutants contributing to the photochemical ozone creation potential are lower than **0.05** kg PO43- eq per 1 MWh of electricity output to the power grid or to directly connected customers. The calculation of the eutrophication potential includes all pollutants relevant for the activity, in particular NO_x, NH_4^+, N, PO_4^{3-}, P and COD (chemical oxygen demand).

4. Particulate matter PM10:

The life-cycle emissions of PM10 are lower than **0.05** kg/per 1 MWh of electricity output to the power grid or to directly connected customers.

5. Fine particulate matter PM2.5:

The life-cycle emissions of PM10 are lower than **0.02** kg/per 1 MWh of electricity output to the power grid or to directly connected customers.

6. Activity-specific criteria:

N/A

Methodology for calculation of criterion 1. Acidification potential, 2. Photochemical ozone creation and 3. Eutrophication based on one of the following:

Life-cycle environmental impacts are calculated using Commission Recommendation 2013/179/EU or, alternatively, using ISO 14025:2010 and ISO 14040:2006 and ISO 14044:2006. Lifecycle environmental impacts are third party verified in according with the procedure described in ISO 14044.

Methodology for splitting of emissions between electricity and heat output from cogeneration (CPH):

Splitting of pollutant emissions between electricity output and heat output is carried out in analogy to Energy Efficiency Directive Annex II (split of pollutants like split of primary energy to the electricity and heat output):

$$m(Poll, el) = m(Poll, total)\ \frac{\frac{\text{CHP E}\eta}{\text{Ref E}\eta}}{\frac{\text{CHP H}\eta}{\text{Ref H}\eta} + \frac{\text{CHP E}\eta}{\text{Ref E}\eta}}$$

Where:

m(Poll,el) is the emission of a pollutant attributed to the electricity output of the cogeneration plant

m(Poll,total) is the total emission of a pollutant from the cogeneration plant

CHP Hη is the heat efficiency of the cogeneration production defined as annual useful heat output divided by the fuel input used to produce the sum of useful heat output and electricity from cogeneration.

Ref Hη is the efficiency reference value for separate heat production.

CHP Eη is the electrical efficiency of the cogeneration production defined as annual electricity from cogeneration divided by the fuel input used to produce the sum of useful heat output and electricity from cogeneration. Where a cogeneration unit generates mechanical energy, the annual electricity from cogeneration may be increased by an additional element representing the amount of electricity which is equivalent to that of mechanical energy. This additional element does not create a right to issue guarantees of origin in accordance with Article 14(10).

Ref Eη is the efficiency reference value for separate electricity production."

The reference values Ref Hη and Ref Eη (as also referred to in Annex II of the EED) are defined in: Harmonised efficiency reference values 2015 (Commission Delegated Regulation (EU) 2015/2402), Annex I (separate production of electricity) and Annex II (separate production of heat)[369].

Do no significant harm ('DNSH')

(1) Climate change mitigation	*This criterion is not in the scope of this call for feedback.*
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.

[369] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32015R2402

(3) Sustainable use and protection of water and marine resources	N/A
(4) Transition to circular economy	The activity assesses availability of and, where feasible, uses equipment and components of high durability and recyclability and that are easy to dismantle and refurbish.
(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appending D of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.

Rationale

On the choice of activities (i.e. different technologies) for power generation

The selection includes **activities** for which the conducted analysis shows that they are **in principle capable of fulfilling the proposed TSC**. Depending on the pending decision which SC threshold is selected for the Acidification Potential, not for all proposed activities, evidence was found that they could fulfil the TSC; however, due the available data for life-cycle pollutant emissions are limited, so when in doubt, the activities in question were included in the proposal (e.g. power from geothermal energy).

Nevertheless, other activities (technologies) are not included in the proposal. Power generation using liquid fuels (oil) and biomass were not included because the available data range showed their performance concerning the pollution objective is, by far, insufficient to achieve with the proposed SC thresholds. Therefore it appears unrealistic that currently any aligned assets exist that could be invested in. Hence, these activities are not proposed for the taxonomy.

Both combined heat and power generation (**CHP, cogeneration**) and power generation without heat utilisation are included.

On the criteria for substantial contribution (SC)

For all power generation activities, the same **overarching thresholds for five pollution criteria** are proposed. They address the most significant air pollutant emissions resulting from these activities in the European Union at present. These five criteria cover **life-cycle** emissions, i.e. the value chain until the generated power is delivered to the grid (or to directly connected customers), which includes direct emissions during electricity generation and indirection emissions from upstream stages (fuel production and transport), construction of the power generation facilities and production of the required components.

For **some of the activities, additional criteria** are proposed, to account for environmental specificities of the activity, or to ensure that EU legal requirements, which apply to direct instead life-cycle emissions, are also fulfilled. (These were taken from the DA Climate change mitigation criteria for DNSH concerning the Pollution objective of these activities.)

The proposed **SC threshold levels** result from the analysis of life-cycle pollution data from scientific publications and recent Environmental Product Declarations (EPDs), covering power generation using different technologies.

In the available data sources, the pollutants are either reported by substance (e.g. NOx, SO2, …) or partly combined to **metrics per type of environmental impact** (e.g. the acidification potential, which covers NOx and SO2 and, depending on the methodology, some further acidifying substances which are emitted at lower levels in power generation).

The proposed criteria use the approach of grouping pollutants based on their environmental impact. This choice allows for a lower number of criteria and is already applied in the market, for example due to its application in the EPD methodology for power generation.

The methodology for splitting the emissions between the power output and the heat output, which is required because only the power output of the **CHP** plants is covered by the activities, is proposed in analogy to the Annex II of the Energy Efficiency Directive.

Rationale for choosing the proposed SC criteria and thresholds:

1. Acidification potential (kg SO2 eq per MWh)

Includes SO2 and NOx (and depending on methodology, further pollutants)

Very significant parameter because current emissions from electricity generation are very high. The proposed conversion factors are based on Hauschild & Wenzel, 1998.

Pending decision on the threshold level of Acidification potential:

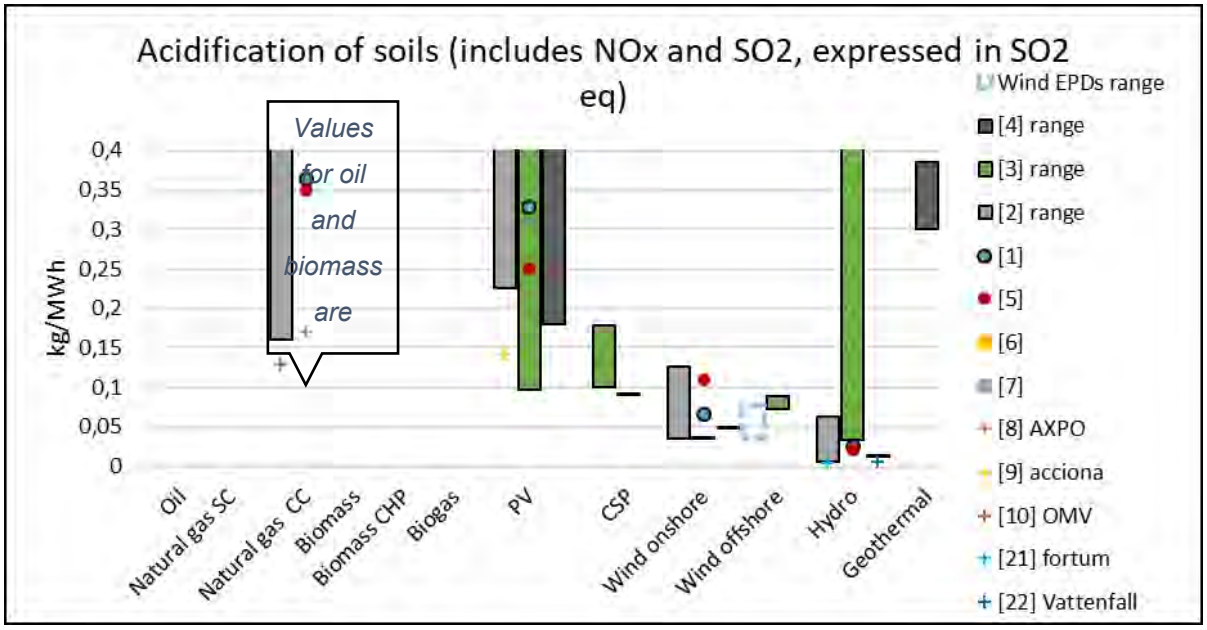
Threshold Options (all expressed in kg SO2 eq per MWh):

a) 0.05

b) 0.15

c) 0.10

The result of the data analysis is shown in the following chart, the arguments for each of the three threshold levels are presented after the chart.



[1] to [7] represent data from scientific publications (filled circles and range bars), [8]-22] represent EPDs (with [11-20] wind power EPDs shown as blue dashed range), [10] Represents NOx and SOx data from emission compliance monitoring & measurement from the power plant and internally calculated pollution data (NOx/SOx) from upstream gas field operation (based on officially reported fuel consumption for gas field operation) from the fuel provision part.

Arguments for the three threshold options:

a) 0.05

This threshold is achieved by a part of literature data (representing somewhat older data) and part of recent wind plant data as well as all recent and part of older hydropower; (currently) not achieved by PV/CSP, geothermal and natural gas.

Arguments in favour of this threshold:

- Pro:
  Evidence is robust that it is possible to generate power by wind power and hydropower at this performance level (i.e. the threshold does not represent a single best performing plant, but is achieved by a range of plants, as shown by different literature sources and recent EPDs).

- Pro:
  This is the most ambitious threshold choice. The PSFs Headline Ambition Level for the Objective “Pollution Prevention and Control” sets 2030 as the target year for preventing and eliminating pollution. Power plants and infrastructure have a long lifetime, roughly 30 – 100 years. So the current criteria proposals will cover physical infrastructure which will still be largely in operation by 2030 and thus is relevant for achieving the 2030 target. Based on the assessment carried out, it is not possible to fully prevent or eliminate pollution for power generation. However, by this threshold choice, the taxonomy highlights the strongest (currently possible) contributing performing activities to the Headline Ambition.

- Pro:
  In the area of pollution, the Green Deals is very ambitions and specifies “Zero Pollution” at the EU’s target. Likewise, the EC recently published the “Zero pollution action plan”. Therefore is appropriate to set the pollution threshold in the taxonomy, which is a voluntary and transparency instrument, to the most ambitions threshold choice.

- Pro:
  This level is achievable by wind onshore, wind offshore and hydropower, thus not limited to a single technology. (Possibly also soon achievable by PV/CSP due to rapid technology development and reduction of coal-related pollution in power generation for component production process.)

- Pro:
  To set this threshold, for which in none of the activities (technologies) every plant achieves this level, gives incentives to some activities to improve.

b) 0.15

This threshold is achieved by all of analysed wind energy data, most hydropower (all of the recent EPDs), CSP and the best PV and the best performing gas (CC gas plants).

Arguments in favour of this threshold:

- Pro:
  This level can be achieved by more technologies, e.g. best-performing gas power plants, therefore more assets included

- Pro:
  The initial Ramboll study has assessed a high improvement opportunity for the sector energy production and distribution. Identified improvement opportunities for achieving high improvement potential are related to technical and (post-)combustion modification and NOx/SOx removal processes. Having the acidification threshold set at 0.15 would give the opportunity for high performing CCGT with low pollution impact from upstream fuel provision to deliver substantial positive environmental impact on the basis of life-cycle considerations.

- Pro:
  It gives incentives for gas power plants (CCGT: combined-cycle gas turbine) and gas-fired CHP, so they reduce their pollution, in a way that they could contribute to EU objectives.

On the proposed, possible option of exempting wind power from demonstrating SC in case of the threshold level of 0.15:

At this threshold level, wind power could be exempted from proving threshold compliance, because based on the analysed data, it appears that all wind power will achieve this performance level.

c) 0.10

This threshold is achieved by all of recent wind energy (EPD) and all of recent hydropower data (EPDs, they are existing/old power plants); some CSP and some of PV (1 recent plant not), not by gas.

Arguments in favour of this threshold:

- Pro: “compromise solution” between 0.05 and 0.15.

2. Photochemical ozone creation potential: **0.05** kg C2H2 eq per MWh

The proposed threshold is achieved by geothermal, hydro (except 1 source), wind, CSP, most PV, partly by biomass, most natural gas CC.

This parameter covers in particular CO, NOx and VOCs (volatile organic compounds). VOCs are classified into the following categories: alkanes, halogenated HCs, alcohols, ketones, esters, ethers, olefins,

acetylenes, aromatics and aldehydes.

3. Eutrophication potential: **0.05** kg PO43- eq per MWh

The proposed threshold is for PV possible to achieve, achieved by most hydro, achieved by all wind and geothermal as well as CSP; partly achieved by gas CC and PV. The proposed conversion factors are based on Heijungs et al. (1992).

4. PM10: **0.05** kg/per MWh

The proposed threshold is achieved by all wind, all hydro, most gas CC, all EPDs plants.

5. PM2.5: **0.02** kg/per MWh

The proposed threshold is achieved by almost all wind, all hydro, PV most recent data, gas CC.

6. Activity-specific criteria

These parameters, which have been set for DNSH for some of these activities in the Delegated act on climate change mitigation, dealing with specific issues only relevant for certain technologies (e.g. anti-fouling paint and biocides for ocean energy technologies), or to ensure current EU legal minimum environmental performance (e.g. for direct emissions, achieving the BAT-AEL ranges where applicable), **are proposed in addition to the five common overarching SC criteria**.

In the case of power generation from natural gas, the criteria from the activity "4.7 Electricity generation from renewable non-fossil gaseous and liquid fuels" of the climate change mitigation DA were used, because they cover the same legislation that also applies to natural gas-fired power plants (BAT, Medium combustion plant directive).

Pollutants considered, but not included in proposal

Metals and metalloids (As, Cd, Pb; Hg) and PAH: would have been relevant for biomass, but power generation is not proposed as an activity for other reasons (see above); poor data availability for life-cycle emissions of these pollutants was noted.

Sources

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3.13 Power from cogeneration of heat/cool and power from geothermal energy

Description of the activity

Construction and operation of facilities co-generating heat/cool and power from geothermal energy. (4.18 Cogeneration of heat/cool and power from geothermal energy in Climate change mitigation DA, but limited to power)

The activity is classified under NACE code D35.11 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

Substantial contribution to pollution prevention and control

The activity complies with all of the following criteria:

1. Acidification potential

Pending decision on the threshold level (see Rationale for details):

Threshold Options:

The life-cycle emissions of pollutants contributing to the acidification potential are lower than…

- **0.05**
- **0.15** (possible exemption: wind power does not have to demonstrate achievement of this threshold)
- **0.10**

… kg SO_2 eq per 1 MWh of electricity output to the power grid or to directly connected customers. The calculation of the acidification potential includes all pollutants relevant for the activity, in particular NO_x, SO_2 and NH_3.

2. Photochemical ozone creation potential:

The life-cycle emissions of pollutants contributing to the photochemical ozone creation potential are lower than **0.05** kg C2H2 eq per 1 MWh of electricity output to the power grid or to directly connected customers. The calculation of the photochemical ozone creation potential includes all pollutants relevant for the activity, in particular CO, NOx and relevant VOCs.

3. Eutrophication potential:

The life-cycle emissions of pollutants contributing to the photochemical ozone creation potential are lower than **0.05** kg PO43- eq per 1 MWh of electricity output to the power grid or to directly connected customers. The calculation of the eutrophication potential includes all pollutants relevant for the activity, in particular NO_x, NH_4^+, N, PO_4^{3-}, P and COD (chemical oxygen demand).

4. Particulate matter PM10:

The life-cycle emissions of PM10 are lower than **0.05** kg/per 1 MWh of electricity output to the power grid or to directly connected customers.

5. Fine particulate matter PM2.5:

The life-cycle emissions of PM10 are lower than **0.02** kg/per 1 MWh of electricity output to the power grid or to directly connected customers.

6. Activity-specific criteria:

For the operation of **high-enthalpy geothermal** energy systems, adequate abatement systems are in place to reduce emission levels in order not to hamper the achievement of **air quality** limit values set out in Directives 2004/107/EC and 2008/50/EC.

Methodology for calculation of criterion 1. Acidification potential, 2. Photochemical ozone creation and 3. Eutrophication based on one of the following:

Life-cycle environmental impacts are calculated using Commission Recommendation 2013/179/EU or, alternatively, using ISO 14025:2010 and ISO 14040:2006 and ISO 14044:2006. Lifecycle environmental impacts are third party verified in according with the procedure described in ISO 14044.

Methodology for splitting of emissions between electricity and heat output from cogeneration (CPH):

Splitting of pollutant emissions between electricity output and heat output is carried out in analogy to Energy Efficiency Directive Annex II (split of pollutants like split of primary energy to the electricity and heat output):

$$m(Poll, el) = m(Poll, total)\ \frac{\frac{\text{CHP E}\eta}{\text{Ref E}\eta}}{\frac{\text{CHP H}\eta}{\text{Ref H}\eta} + \frac{\text{CHP E}\eta}{\text{Ref E}\eta}}$$

Where:

m(Poll,el) is the emission of a pollutant attributed to the electricity output of the cogeneration plant

m(Poll,total) is the total emission of a pollutant from the cogeneration plant

CHP Hη is the heat efficiency of the cogeneration production defined as annual useful heat output divided by the fuel input used to produce the sum of useful heat output and electricity from cogeneration.

Ref Hη is the efficiency reference value for separate heat production.

CHP Eη is the electrical efficiency of the cogeneration production defined as annual electricity from cogeneration divided by the fuel input used to produce the sum of useful heat output and electricity from cogeneration. Where a cogeneration unit generates mechanical energy, the annual electricity from cogeneration may be increased by an additional element representing the amount of electricity which is equivalent to that of mechanical energy. This additional element does not create a right to issue guarantees of origin in accordance with Article 14(10).

Ref Eη is the efficiency reference value for separate electricity production."

The reference values Ref Hη and Ref Eη (as also referred to in Annex II of the EED) are defined in: Harmonised efficiency reference values 2015 (Commission Delegated Regulation (EU) 2015/2402), Annex I (separate production of electricity) and Annex II (separate production of heat)[370].

Do no significant harm ('DNSH')

(1) Climate change mitigation	*This criterion is not in the scope of this call for feedback.*
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.
(3) Sustainable use and protection of water and marine resources	DNSH as set out in Appending B of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.

[370] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32015R2402

(4) Transition to circular economy	NA
(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appending D of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.

Rationale

On the choice of activities (i.e. different technologies) for power generation

The selection includes **activities** for which the conducted analysis shows that they are **in principle capable of fulfilling the proposed TSC**. Depending on the pending decision which SC threshold is selected for the Acidification Potential, not for all proposed activities, evidence was found that they could fulfil the TSC; however, due the available data for life-cycle pollutant emissions are limited, so when in doubt, the activities in question were included in the proposal (e.g. power from geothermal energy).

Nevertheless, other activities (technologies) are not included in the proposal. Power generation using liquid fuels (oil) and biomass were not included because the available data range showed their performance concerning the pollution objective is, by far, insufficient to achieve with the proposed SC thresholds. Therefore it appears unrealistic that currently any aligned assets exist that could be invested in. Hence, these activities are not proposed for the taxonomy.

Both combined heat and power generation (**CHP, cogeneration**) and power generation without heat utilisation are included.

On the criteria for substantial contribution (SC)

For all power generation activities, the same **overarching thresholds for five pollution criteria** are proposed. They address the most significant air pollutant emissions resulting from these activities in the European Union at present. These five criteria cover **life-cycle** emissions, i.e. the value chain until the generated power is delivered to the grid (or to directly connected customers), which includes direct emissions during electricity generation and

indirection emissions from upstream stages (fuel production and transport), construction of the power generation facilities and production of the required components.

For **some of the activities, additional criteria** are proposed, to account for environmental specificities of the activity, or to ensure that EU legal requirements, which apply to direct instead life-cycle emissions, are also fulfilled. (These were taken from the DA Climate change mitigation criteria for DNSH concerning the Pollution objective of these activities.)

The proposed **SC threshold levels** result from the analysis of life-cycle pollution data from scientific publications and recent Environmental Product Declarations (EPDs), covering power generation using different technologies.

In the available data sources, the pollutants are either reported by substance (e.g. NOx, SO2, …) or partly combined to **metrics per type of environmental impact** (e.g. the acidification potential, which covers NOx and SO2 and, depending on the methodology, some further acidifying substances which are emitted at lower levels in power generation).

The proposed criteria use the approach of grouping pollutants based on their environmental impact. This choice allows for a lower number of criteria and is already applied in the market, for example due to its application in the EPD methodology for power generation.

The methodology for splitting the emissions between the power output and the heat output, which is required because only the power output of the **CHP** plants is covered by the activities, is proposed in analogy to the Annex II of the Energy Efficiency Directive.

Rationale for choosing the proposed SC criteria and thresholds:

1. Acidification potential (kg SO2 eq per MWh)

Includes SO2 and NOx (and depending on methodology, further pollutants)

Very significant parameter because current emissions from electricity generation are very high. The proposed conversion factors are based on Hauschild & Wenzel, 1998.

Pending decision on the threshold level of Acidification potential:

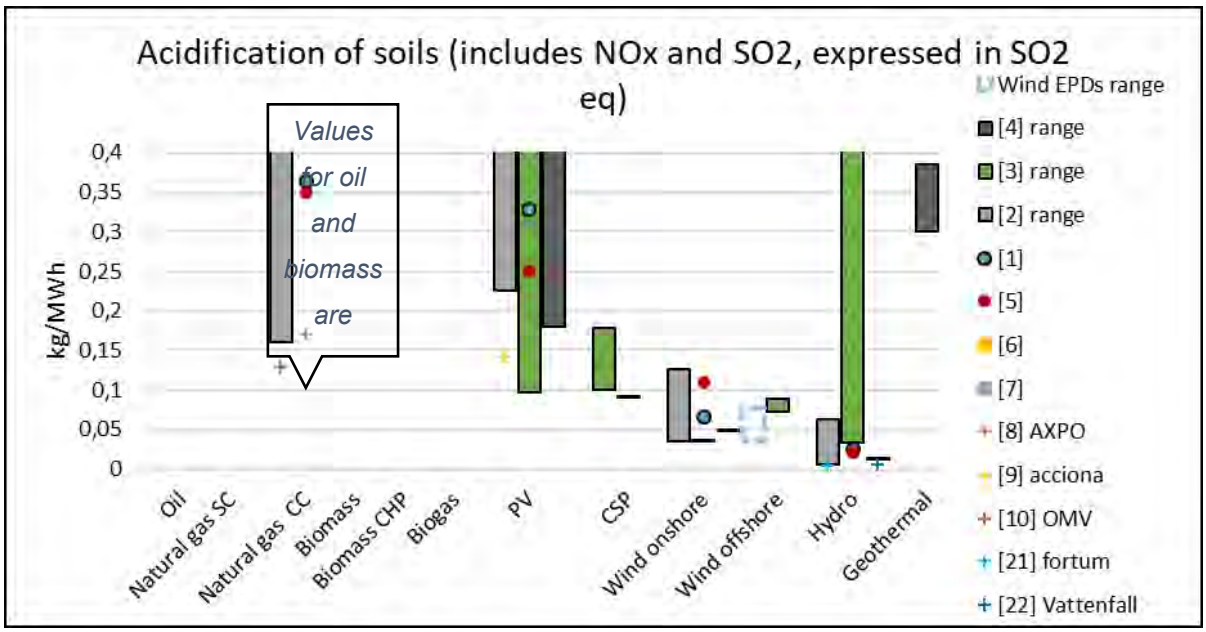
Threshold Options (all expressed in kg SO2 eq per MWh):

a) 0.05

b) 0.15

c) 0.10

The result of the data analysis is shown in the following chart, the arguments for each of the three threshold levels are presented after the chart.



[1] to [7] represent data from scientific publications (filled circles and range bars), [8]-22] represent EPDs (with [11-20] wind power EPDs shown as blue dashed range), [10] Represents NOx and SOx data from emission compliance monitoring & measurement from the power plant and internally calculated pollution data (NOx/SOx) from upstream gas field operation (based on officially reported fuel consumption for gas field operation) from the fuel provision part.

Arguments for the three threshold options:

a) 0.05

This threshold is achieved by a part of literature data (representing somewhat older data) and part of recent wind plant data as well as all recent and part of older hydropower; (currently) not achieved by PV/CSP, geothermal and natural gas.

Arguments in favour of this threshold:

- Pro:
  Evidence is robust that it is possible to generate power by wind power and

hydropower at this performance level (i.e. the threshold does not represent a single best performing plant, but is achieved by a range of plants, as shown by different literature sources and recent EPDs).

- Pro:
  This is the most ambitious threshold choice. The PSFs Headline Ambition Level for the Objective “Pollution Prevention and Control” sets 2030 as the target year for preventing and eliminating pollution. Power plants and infrastructure have a long lifetime, roughly 30 – 100 years. So the current criteria proposals will cover physical infrastructure which will still be largely in operation by 2030 and thus is relevant for achieving the 2030 target. Based on the assessment carried out, it is not possible to fully prevent or eliminate pollution for power generation. However, by this threshold choice, the taxonomy highlights the strongest (currently possible) contributing performing activities to the Headline Ambition.

- Pro:
  In the area of pollution, the Green Deals is very ambitions and specifies “Zero Pollution” at the EU’s target. Likewise, the EC recently published the “Zero pollution action plan”. Therefore is appropriate to set the pollution threshold in the taxonomy, which is a voluntary and transparency instrument, to the most ambitions threshold choice.

- Pro:
  This level is achievable by wind onshore, wind offshore and hydropower, thus not limited to a single technology. (Possibly also soon achievable by PV/CSP due to rapid technology development and reduction of coal-related pollution in power generation for component production process.)

- Pro:
  To set this threshold, for which in none of the activities (technologies) every plant achieves this level, gives incentives to some activities to improve.

b) 0.15

This threshold is achieved by all of analysed wind energy data, most hydropower (all of the recent EPDs), CSP and the best PV and the best performing gas (CC gas plants).

Arguments in favour of this threshold:

- Pro:
  This level can be achieved by more technologies, e.g. best-performing gas power plants, therefore more assets included

- Pro:
  The initial Ramboll study has assessed a high improvement opportunity for the sector energy production and distribution. Identified improvement opportunities for achieving high improvement potential are related to technical and (post-)combustion modification and NOx/SOx removal processes. Having the acidification threshold set at 0.15 would give the opportunity for high performing CCGT with low pollution impact from upstream fuel provision to deliver substantial positive environmental impact on the basis of life-cycle considerations.

- Pro:
  It gives incentives for gas power plants (CCGT: combined-cycle gas turbine) and gas-fired CHP, so they reduce their pollution, in a way that they could contribute to EU objectives.

On the proposed, possible option of exempting wind power from demonstrating SC in case of the threshold level of 0.15:

At this threshold level, wind power could be exempted from proving threshold compliance, because based on the analysed data, it appears that all wind power will achieve this performance level.

c) 0.10

This threshold is achieved by all of recent wind energy (EPD) and all of recent hydropower data (EPDs, they are existing/old power plants); some CSP and some of PV (1 recent plant not), not by gas.

Arguments in favour of this threshold:

- Pro: “compromise solution” between 0.05 and 0.15.

2. Photochemical ozone creation potential: **0.05** kg C2H2 eq per MWh

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This parameter covers in particular CO, NOx and VOCs (volatile organic compounds). VOCs are classified into the following categories: alkanes, halogenated HCs, alcohols, ketones, esters, ethers, olefins,

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3. Eutrophication potential: **0.05** kg PO43- eq per MWh

The proposed threshold is for PV possible to achieve, achieved by most hydro, achieved by all wind and geothermal as well as CSP; partly achieved by gas CC and PV. The proposed conversion factors are based on Heijungs et al. (1992).

4. PM10: **0.05** kg/per MWh

The proposed threshold is achieved by all wind, all hydro, most gas CC, all EPDs plants.

5. PM2.5: **0.02** kg/per MWh

The proposed threshold is achieved by almost all wind, all hydro, PV most recent data, gas CC.

6. Activity-specific criteria

These parameters, which have been set for DNSH for some of these activities in the Delegated act on climate change mitigation, dealing with specific issues only relevant for certain technologies (e.g. anti-fouling paint and biocides for ocean energy technologies), or to ensure current EU legal minimum environmental performance (e.g. for direct emissions, achieving the BAT-AEL ranges where applicable), **are proposed in addition to the five common overarching SC criteria**.

In the case of power generation from natural gas, the criteria from the activity “4.7 Electricity generation from renewable non-fossil gaseous and liquid fuels” of the climate change

mitigation DA were used, because they cover the same legislation that also applies to natural gas-fired power plants (BAT, Medium combustion plant directive).

Pollutants considered, but not included in proposal

Metals and metalloids (As, Cd, Pb; Hg) and PAH: would have been relevant for biomass, but power generation is not proposed as an activity for other reasons (see above); poor data availability for life-cycle emissions of these pollutants was noted.

Sources

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3.14 Power from cogeneration of heat/cool and power from natural gas

Description of the activity

Construction and operation of combined heat/cool and power generation facilities using natural gas.

The activity is classified under NACE code D35.11 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

Substantial contribution to pollution prevention and control

The activity complies with all of the following criteria:

1. Acidification potential

Pending decision on the threshold level (see Rationale for details):

Threshold Options:

The life-cycle emissions of pollutants contributing to the acidification potential are lower than…

- **0.05**

- **0.15** (possible exemption: wind power does not have to demonstrate achievement of this threshold)

- **0.10**

… kg SO_2 eq per 1 MWh of electricity output to the power grid or to directly connected customers. The calculation of the acidification potential includes all pollutants relevant for the activity, in particular NO_x, SO_2 and NH_3.

2. Photochemical ozone creation potential:

The life-cycle emissions of pollutants contributing to the photochemical ozone creation potential are lower than **0.05** kg C2H2 eq per 1 MWh of electricity output to the power grid or to directly connected customers. The calculation of the photochemical ozone creation potential includes all pollutants relevant for the activity, in particular CO, NOx and relevant VOCs.

3. Eutrophication potential:

The life-cycle emissions of pollutants contributing to the photochemical ozone creation potential are lower than **0.05** kg PO43- eq per 1 MWh of electricity output to the power grid or to directly connected customers. The calculation of the eutrophication potential includes all pollutants relevant for the activity, in particular NO_x, NH_4^+, N, PO_4^{3-}, P and COD (chemical oxygen demand).

4. Particulate matter PM10:

The life-cycle emissions of PM10 are lower than **0.05** kg/per 1 MWh of electricity output to the power grid or to directly connected customers.

5. Fine particulate matter PM2.5:

The life-cycle emissions of PM10 are lower than **0.02** kg/per 1 MWh of electricity output to the power grid or to directly connected customers.

6. Activity-specific criteria:

Emissions are within or lower than the emission levels associated with the best available techniques (BAT-AEL) ranges set out in the latest relevant best available techniques (**BAT**)

conclusions, including the best available techniques (BAT) conclusions for large combustion plants[371]. No significant cross-media effects occur.

For combustion plants with thermal input greater than 1 MW but below the thresholds for the BAT conclusions for large combustion plants to apply, emissions are below the emission limit values set out in Annex II, part 2, to Directive (EU) 2015/2193.

Methodology for calculation of criterion 1. Acidification potential, 2. Photochemical ozone creation and 3. Eutrophication based on one of the following:

Life-cycle environmental impacts are calculated using Commission Recommendation 2013/179/EU or, alternatively, using ISO 14025:2010 and ISO 14040:2006 and ISO 14044:2006. Lifecycle environmental impacts are third party verified in according with the procedure described in ISO 14044.

Methodology for splitting of emissions between electricity and heat output from cogeneration (CPH):

Splitting of pollutant emissions between electricity output and heat output is carried out in analogy to Energy Efficiency Directive Annex II (split of pollutants like split of primary energy to the electricity and heat output):

$$m(Poll, el) = m(Poll, total)\ \frac{\frac{\text{CHP E}\eta}{\text{Ref E}\eta}}{\frac{\text{CHP H}\eta}{\text{Ref H}\eta} + \frac{\text{CHP E}\eta}{\text{Ref E}\eta}}$$

Where:

m(Poll,el) is the emission of a pollutant attributed to the electricity output of the cogeneration plant

m(Poll,total) is the total emission of a pollutant from the cogeneration plant

[371] Implementing Decision (EU) 2017/1442.

CHP Hη is the heat efficiency of the cogeneration production defined as annual useful heat output divided by the fuel input used to produce the sum of useful heat output and electricity from cogeneration.

Ref Hη is the efficiency reference value for separate heat production.

CHP Eη is the electrical efficiency of the cogeneration production defined as annual electricity from cogeneration divided by the fuel input used to produce the sum of useful heat output and electricity from cogeneration. Where a cogeneration unit generates mechanical energy, the annual electricity from cogeneration may be increased by an additional element representing the amount of electricity which is equivalent to that of mechanical energy. This additional element does not create a right to issue guarantees of origin in accordance with Article 14(10).

Ref Eη is the efficiency reference value for separate electricity production."

The reference values Ref Hη and Ref Eη (as also referred to in Annex II of the EED) are defined in: Harmonised efficiency reference values 2015 (Commission Delegated Regulation (EU) 2015/2402), Annex I (separate production of electricity) and Annex II (separate production of heat)[372].

Do no significant harm ('DNSH')

(1) Climate change mitigation	*This criterion is not in the scope of this call for feedback.*
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.

[372] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32015R2402

(3) Sustainable use and protection of water and marine resources	DNSH as set out in Appending B of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.
(4) Transition to circular economy	The activity assesses availability of and, where feasible, uses equipment and components of high durability and recyclability and that are easy to dismantle and refurbish.
(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appending D of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.

Rationale

On the choice of activities (i.e. different technologies) for power generation

The selection includes **activities** for which the conducted analysis shows that they are **in principle capable of fulfilling the proposed TSC**. Depending on the pending decision which SC threshold is selected for the Acidification Potential, not for all proposed activities, evidence was found that they could fulfil the TSC; however, due the available data for life-cycle pollutant emissions are limited, so when in doubt, the activities in question were included in the proposal (e.g. power from geothermal energy).

Nevertheless, other activities (technologies) are not included in the proposal. Power generation using liquid fuels (oil) and biomass were not included because the available data range showed their performance concerning the pollution objective is, by far, insufficient to achieve with the proposed SC thresholds. Therefore it appears unrealistic that currently any aligned assets exist that could be invested in. Hence, these activities are not proposed for the taxonomy.

Both combined heat and power generation (**CHP, cogeneration**) and power generation without heat utilisation are included.

On the criteria for substantial contribution (SC)

For all power generation activities, the same **overarching thresholds for five pollution criteria** are proposed. They address the most significant air pollutant emissions resulting from these activities in the European Union at present. These five criteria cover **life-cycle** emissions, i.e. the value chain until the generated power is delivered to the grid (or to directly connected customers), which includes direct emissions during electricity generation and indirection emissions from upstream stages (fuel production and transport), construction of the power generation facilities and production of the required components.

For **some of the activities, additional criteria** are proposed, to account for environmental specificities of the activity, or to ensure that EU legal requirements, which apply to direct instead life-cycle emissions, are also fulfilled. (These were taken from the DA Climate change mitigation criteria for DNSH concerning the Pollution objective of these activities.)

The proposed **SC threshold levels** result from the analysis of life-cycle pollution data from scientific publications and recent Environmental Product Declarations (EPDs), covering power generation using different technologies.

In the available data sources, the pollutants are either reported by substance (e.g. NOx, SO2, …) or partly combined to **metrics per type of environmental impact** (e.g. the acidification potential, which covers NOx and SO2 and, depending on the methodology, some further acidifying substances which are emitted at lower levels in power generation).

The proposed criteria use the approach of grouping pollutants based on their environmental impact. This choice allows for a lower number of criteria and is already applied in the market, for example due to its application in the EPD methodology for power generation.

The methodology for splitting the emissions between the power output and the heat output, which is required because only the power output of the **CHP** plants is covered by the activities, is proposed in analogy to the Annex II of the Energy Efficiency Directive.

Rationale for choosing the proposed SC criteria and thresholds:

1. Acidification potential (kg SO2 eq per MWh)

Includes SO2 and NOx (and depending on methodology, further pollutants)

Very significant parameter because current emissions from electricity generation are very high. The proposed conversion factors are based on Hauschild & Wenzel, 1998.

Pending decision on the threshold level of Acidification potential:

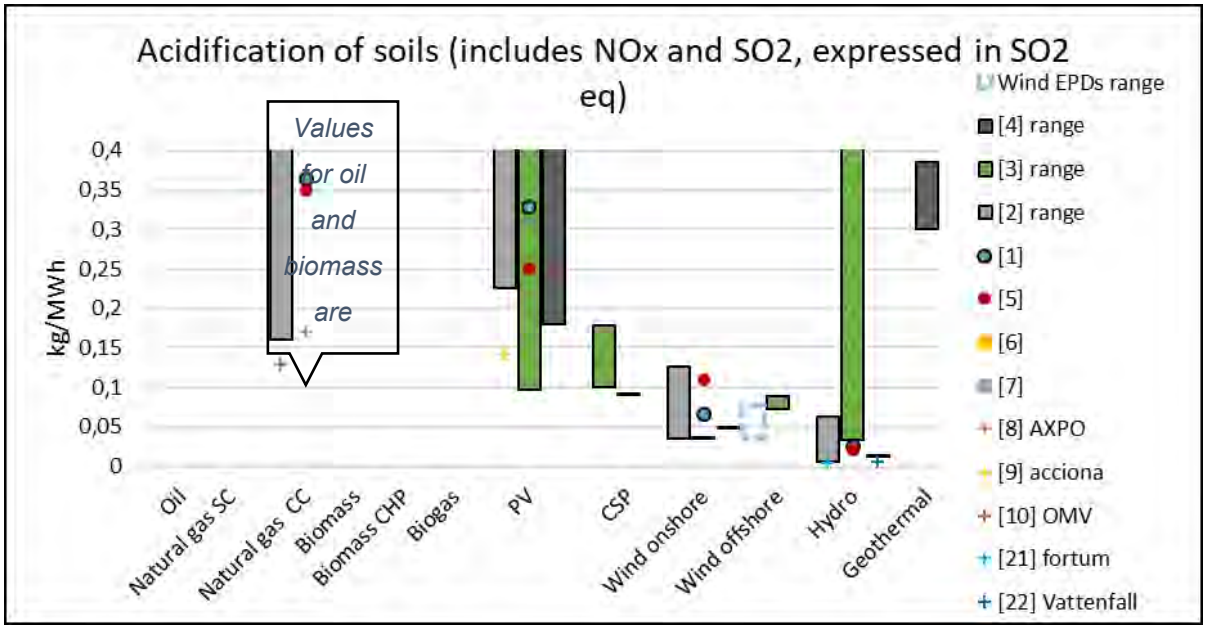
Threshold Options (all expressed in kg SO2 eq per MWh):

a) 0.05

b) 0.15

c) 0.10

The result of the data analysis is shown in the following chart, the arguments for each of the three threshold levels are presented after the chart.



[1] to [7] represent data from scientific publications (filled circles and range bars), [8]-22] represent EPDs (with [11-20] wind power EPDs shown as blue dashed range), [10] Represents NOx and SOx data from emission compliance monitoring & measurement from the power plant and internally calculated pollution data (NOx/SOx) from upstream gas field operation (based on officially reported fuel consumption for gas field operation) from the fuel provision part.

Arguments for the three threshold options:

a) 0.05

This threshold is achieved by a part of literature data (representing somewhat older data) and part of recent wind plant data as well as all recent and part of older hydropower; (currently) not achieved by PV/CSP, geothermal and natural gas.

Arguments in favour of this threshold:

- Pro:
  Evidence is robust that it is possible to generate power by wind power and hydropower at this performance level (i.e. the threshold does not represent a single best performing plant, but is achieved by a range of plants, as shown by different literature sources and recent EPDs).

- Pro:
  This is the most ambitious threshold choice. The PSFs Headline Ambition Level for the Objective “Pollution Prevention and Control” sets 2030 as the target year for preventing and eliminating pollution. Power plants and infrastructure have a long lifetime, roughly 30 – 100 years. So the current criteria proposals will cover physical infrastructure which will still be largely in operation by 2030 and thus is relevant for achieving the 2030 target. Based on the assessment carried out, it is not possible to fully prevent or eliminate pollution for power generation. However, by this threshold choice, the taxonomy highlights the strongest (currently possible) contributing performing activities to the Headline Ambition.

- Pro:
  In the area of pollution, the Green Deals is very ambitions and specifies “Zero Pollution” at the EU’s target. Likewise, the EC recently published the “Zero pollution action plan”. Therefore is appropriate to set the pollution threshold in the taxonomy, which is a voluntary and transparency instrument, to the most ambitions threshold choice.

- Pro:
  This level is achievable by wind onshore, wind offshore and hydropower, thus not limited to a single technology. (Possibly also soon achievable by PV/CSP due to rapid technology development and reduction of coal-related pollution in power generation for component production process.)

- Pro:
  To set this threshold, for which in none of the activities (technologies) every plant achieves this level, gives incentives to some activities to improve.

b) 0.15

This threshold is achieved by all of analysed wind energy data, most hydropower (all of the recent EPDs), CSP and the best PV and the best performing gas (CC gas plants).

Arguments in favour of this threshold:

- Pro:
  This level can be achieved by more technologies, e.g. best-performing gas power plants, therefore more assets included

- Pro:
  The initial Ramboll study has assessed a high improvement opportunity for the sector energy production and distribution. Identified improvement opportunities for achieving high improvement potential are related to technical and (post-)combustion modification and NOx/SOx removal processes. Having the acidification threshold set at 0.15 would give the opportunity for high performing CCGT with low pollution impact from upstream fuel provision to deliver substantial positive environmental impact on the basis of life-cycle considerations.

- Pro:
  It gives incentives for gas power plants (CCGT: combined-cycle gas turbine) and gas-fired CHP, so they reduce their pollution, in a way that they could contribute to EU objectives.

On the proposed, possible option of exempting wind power from demonstrating SC in case of the threshold level of 0.15:

At this threshold level, wind power could be exempted from proving threshold compliance, because based on the analysed data, it appears that all wind power will achieve this performance level.

c) 0.10

This threshold is achieved by all of recent wind energy (EPD) and all of recent hydropower data (EPDs, they are existing/old power plants); some CSP and some of PV (1 recent plant not), not by gas.

Arguments in favour of this threshold:

- Pro: “compromise solution” between 0.05 and 0.15.

2. Photochemical ozone creation potential: **0.05** kg C2H2 eq per MWh

The proposed threshold is achieved by geothermal, hydro (except 1 source), wind, CSP, most PV, partly by biomass, most natural gas CC.

This parameter covers in particular CO, NOx and VOCs (volatile organic compounds). VOCs are classified into the following categories: alkanes, halogenated HCs, alcohols, ketones, esters, ethers, olefins,

acetylenes, aromatics and aldehydes.

3. Eutrophication potential: **0.05** kg PO43- eq per MWh

The proposed threshold is for PV possible to achieve, achieved by most hydro, achieved by all wind and geothermal as well as CSP; partly achieved by gas CC and PV. The proposed conversion factors are based on Heijungs et al. (1992).

4. PM10: **0.05** kg/per MWh

The proposed threshold is achieved by all wind, all hydro, most gas CC, all EPDs plants.

5. PM2.5: **0.02** kg/per MWh

The proposed threshold is achieved by almost all wind, all hydro, PV most recent data, gas CC.

6. Activity-specific criteria

These parameters, which have been set for DNSH for some of these activities in the Delegated act on climate change mitigation, dealing with specific issues only relevant for certain technologies (e.g. anti-fouling paint and biocides for ocean energy technologies), or to ensure current EU legal minimum environmental performance (e.g. for direct emissions, achieving the BAT-AEL ranges where applicable), **are proposed in addition to the five common overarching SC criteria**.

In the case of power generation from natural gas, the criteria from the activity "4.7 Electricity generation from renewable non-fossil gaseous and liquid fuels" of the climate change mitigation DA were used, because they cover the same legislation that also applies to natural gas-fired power plants (BAT, Medium combustion plant directive).

Pollutants considered, but not included in proposal

Metals and metalloids (As, Cd, Pb; Hg) and PAH: would have been relevant for biomass, but power generation is not proposed as an activity for other reasons (see above); poor data availability for life-cycle emissions of these pollutants was noted.

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[10] 2020 OMV 860 MW CCPP Braz

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3.15 Power from cogeneration of heat/cool and power from renewable non-fossil gaseous fuels

Description of the activity

Construction or operation of electricity generation facilities that produce electricity using gaseous of renewable origin. This activity does not include electricity generation from the exclusive use of biogas (see Section 4.8 of this Annex). (as in 4.7 Climate change mitigation DA, but without liquid fuels)

The activity is classified under NACE code D35.11 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

Substantial contribution to pollution prevention and control

The activity complies with all of the following criteria:

1. Acidification potential

Pending decision on the threshold level (see Rationale for details):

Threshold Options:

The life-cycle emissions of pollutants contributing to the acidification potential are lower than…

- **0.05**
- **0.15** (possible exemption: wind power does not have to demonstrate achievement of this threshold)
- **0.10**

… kg SO_2 eq per 1 MWh of electricity output to the power grid or to directly connected customers. The calculation of the acidification potential includes all pollutants relevant for the activity, in particular NO_x, SO_2 and NH_3.

2. Photochemical ozone creation potential:

The life-cycle emissions of pollutants contributing to the photochemical ozone creation potential are lower than **0.05** kg C2H2 eq per 1 MWh of electricity output to the power grid or to directly connected customers. The calculation of the photochemical ozone creation potential includes all pollutants relevant for the activity, in particular CO, NOx and relevant VOCs.

3. Eutrophication potential:

The life-cycle emissions of pollutants contributing to the photochemical ozone creation potential are lower than **0.05** kg PO43- eq per 1 MWh of electricity output to the power grid or to directly connected customers. The calculation of the eutrophication potential includes all pollutants relevant for the activity, in particular NO_x, NH_4^+, N, PO_4^{3-}, P and COD (chemical oxygen demand).

4. Particulate matter PM10:

The life-cycle emissions of PM10 are lower than **0.05** kg/per 1 MWh of electricity output to the power grid or to directly connected customers.

5. Fine particulate matter PM2.5:

The life-cycle emissions of PM10 are lower than **0.02** kg/per 1 MWh of electricity output to the power grid or to directly connected customers.

6. Activity-specific criteria:

For installations falling within the scope of Directive 2010/75/EU, emissions are within or lower than the emission levels associated with the best available techniques (BAT-AEL) ranges set out in the latest relevant best available techniques (BAT) conclusions, including the best available techniques (BAT) conclusions for large combustion plants[373], ensuring at the same time that no significant cross-media effects occur.

For combustion plants with thermal input greater than 1 MW but below the thresholds for the BAT conclusions for large combustion plants to apply, emissions are below the emission limit values set out in Annex II, part 2, to Directive (EU) 2015/2193.

For plants in zones or parts of zones not complying with the air quality limit values laid down in Directive 2008/50/EC, results of the information exchange[374], which are published by the Commission in accordance with Article 6, paragraphs 9 and 10, of Directive (EU) 2015/2193 are taken into account.

In case of anaerobic digestion of organic material, where the produced digestate is used as fertiliser or soil improver, either directly or after composting or any other treatment, it meets the requirements for fertilising materials set out in Component Material Categories (CMC) 4 and 5 in Annex II to Regulation (EU) 2019/1009 or national rules on fertilisers or soil improvers for agricultural use.

For anaerobic digestion plants treating over 100 tonnes per day, emissions to air and water are within or lower than the emission levels associated with the best available techniques (BAT-AEL) ranges set for anaerobic treatment of waste in the latest relevant best available techniques (BAT) conclusions, including the best available techniques (BAT) conclusions for waste treatment[375]. No significant cross-media effects occur.

[373] Implementing Decision (EU) 2017/1442.

[374] The final technology report resulting from the exchange of information with Member States, the industries concerned and non-governmental organisations contains technical information on best available technologies used in medium combustion plants to reduce their environmental impacts, and on the emission levels achievable with best available and emerging technologies and the related costs (version of [adoption date]: https://circabc.europa.eu/ui/group/06f33a94-9829-4eee-b187-21bb783a0fbf/library/9a99a632-9ba8-4cc0-9679-08d929afda59/details).

[375] Implementing Decision (EU) 2018/1147.

Methodology for calculation of criterion 1. Acidification potential, 2. Photochemical ozone creation and 3. Eutrophication based on one of the following:

Life-cycle environmental impacts are calculated using Commission Recommendation 2013/179/EU or, alternatively, using ISO 14025:2010 and ISO 14040:2006 and ISO 14044:2006. Lifecycle environmental impacts are third party verified in according with the procedure described in ISO 14044.

Methodology for splitting of emissions between electricity and heat output from cogeneration (CPH):

Splitting of pollutant emissions between electricity output and heat output is carried out in analogy to Energy Efficiency Directive Annex II (split of pollutants like split of primary energy to the electricity and heat output):

Where:

m(Poll,el) is the emission of a pollutant attributed to the electricity output of the cogeneration plant

m(Poll,total) is the total emission of a pollutant from the cogeneration plant

CHP Hη is the heat efficiency of the cogeneration production defined as annual useful heat output divided by the fuel input used to produce the sum of useful heat output and electricity from cogeneration.

Ref Hη is the efficiency reference value for separate heat production.

CHP Eη is the electrical efficiency of the cogeneration production defined as annual electricity from cogeneration divided by the fuel input used to produce the sum of useful heat output and electricity from cogeneration. Where a cogeneration unit generates mechanical energy, the annual electricity from cogeneration may be increased by an additional element representing the amount of electricity which is equivalent to that of mechanical energy. This additional element does not create a right to issue guarantees of origin in accordance with Article 14(10).

Ref Eη is the efficiency reference value for separate electricity production."

The reference values Ref Hη and Ref Eη (as also referred to in Annex II of the EED) are defined in: Harmonised efficiency reference values 2015 (Commission Delegated Regulation

(EU) 2015/2402), Annex I (separate production of electricity) and Annex II (separate production of heat)[376].

Do no significant harm ('DNSH')

(1) Climate change mitigation	*This criterion is not in the scope of this call for feedback.*
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.
(3) Sustainable use and protection of water and marine resources	DNSH as set out in Appending B of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.
(4) Transition to circular economy	N/A
(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appending D of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.

Rationale

On the choice of activities (i.e. different technologies) for power generation

The selection includes **activities** for which the conducted analysis shows that they are **in principle capable of fulfilling the proposed TSC**. Depending on the pending decision

[376] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32015R2402

which SC threshold is selected for the Acidification Potential, not for all proposed activities, evidence was found that they could fulfil the TSC; however, due the available data for life-cycle pollutant emissions are limited, so when in doubt, the activities in question were included in the proposal (e.g. power from geothermal energy).

Nevertheless, other activities (technologies) are not included in the proposal. Power generation using liquid fuels (oil) and biomass were not included because the available data range showed their performance concerning the pollution objective is, by far, insufficient to achieve with the proposed SC thresholds. Therefore it appears unrealistic that currently any aligned assets exist that could be invested in. Hence, these activities are not proposed for the taxonomy.

Both combined heat and power generation (**CHP, cogeneration**) and power generation without heat utilisation are included.

On the criteria for substantial contribution (SC)

For all power generation activities, the same **overarching thresholds for five pollution criteria** are proposed. They address the most significant air pollutant emissions resulting from these activities in the European Union at present. These five criteria cover **life-cycle** emissions, i.e. the value chain until the generated power is delivered to the grid (or to directly connected customers), which includes direct emissions during electricity generation and indirection emissions from upstream stages (fuel production and transport), construction of the power generation facilities and production of the required components.

For **some of the activities, additional criteria** are proposed, to account for environmental specificities of the activity, or to ensure that EU legal requirements, which apply to direct instead life-cycle emissions, are also fulfilled. (These were taken from the DA Climate change mitigation criteria for DNSH concerning the Pollution objective of these activities.)

The proposed **SC threshold levels** result from the analysis of life-cycle pollution data from scientific publications and recent Environmental Product Declarations (EPDs), covering power generation using different technologies.

In the available data sources, the pollutants are either reported by substance (e.g. NOx, SO2, …) or partly combined to **metrics per type of environmental impact** (e.g. the acidification potential, which covers NOx and SO2 and, depending on the methodology, some further acidifying substances which are emitted at lower levels in power generation).

The proposed criteria use the approach of grouping pollutants based on their environmental impact. This choice allows for a lower number of criteria and is already applied in the market, for example due to its application in the EPD methodology for power generation.

The methodology for splitting the emissions between the power output and the heat output, which is required because only the power output of the **CHP** plants is covered by the activities, is proposed in analogy to the Annex II of the Energy Efficiency Directive.

Rationale for choosing the proposed SC criteria and thresholds:

1. Acidification potential (kg SO2 eq per MWh)

Includes SO2 and NOx (and depending on methodology, further pollutants)

Very significant parameter because current emissions from electricity generation are very high. The proposed conversion factors are based on Hauschild & Wenzel, 1998.

Pending decision on the threshold level of Acidification potential:

Threshold Options (all expressed in kg SO2 eq per MWh):

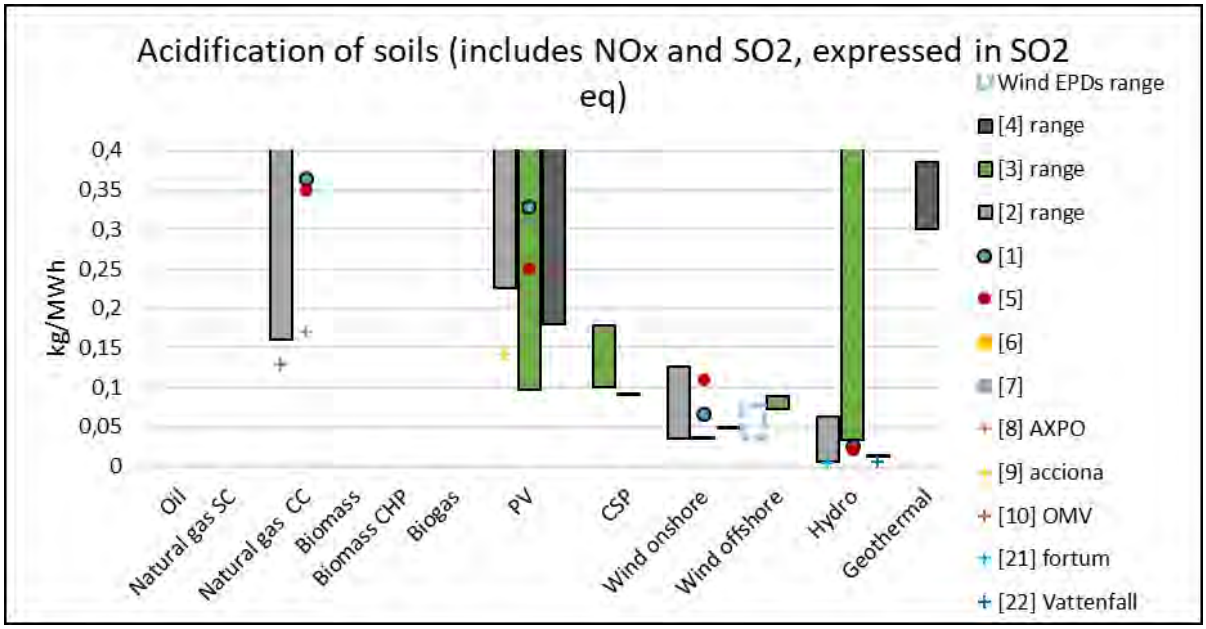
a) 0.05

b) 0.15

c) 0.10

The result of the data analysis is shown in the following chart, the arguments for each of the three threshold levels are presented after the chart.

Values for oil and biomass are



[1] to [7] represent data from scientific publications (filled circles and range bars), [8]-22] represent EPDs (with [11-20] wind power EPDs shown as blue dashed range), [10] Represents NOx and SOx data from emission compliance monitoring & measurement from the power plant and internally calculated pollution data (NOx/SOx) from upstream gas field operation (based on officially reported fuel consumption for gas field operation) from the fuel provision part.

Arguments for the three threshold options:

a) 0.05

This threshold is achieved by a part of literature data (representing somewhat older data) and part of recent wind plant data as well as all recent and part of older hydropower; (currently) not achieved by PV/CSP, geothermal and natural gas.

Arguments in favour of this threshold:

- Pro:
  Evidence is robust that it is possible to generate power by wind power and

hydropower at this performance level (i.e. the threshold does not represent a single best performing plant, but is achieved by a range of plants, as shown by different literature sources and recent EPDs).

- Pro:
  This is the most ambitious threshold choice. The PSFs Headline Ambition Level for the Objective “Pollution Prevention and Control” sets 2030 as the target year for preventing and eliminating pollution. Power plants and infrastructure have a long lifetime, roughly 30 – 100 years. So the current criteria proposals will cover physical infrastructure which will still be largely in operation by 2030 and thus is relevant for achieving the 2030 target. Based on the assessment carried out, it is not possible to fully prevent or eliminate pollution for power generation. However, by this threshold choice, the taxonomy highlights the strongest (currently possible) contributing performing activities to the Headline Ambition.
- Pro:
  In the area of pollution, the Green Deals is very ambitions and specifies “Zero Pollution” at the EU’s target. Likewise, the EC recently published the “Zero pollution action plan”. Therefore is appropriate to set the pollution threshold in the taxonomy, which is a voluntary and transparency instrument, to the most ambitions threshold choice.
- Pro:
  This level is achievable by wind onshore, wind offshore and hydropower, thus not limited to a single technology. (Possibly also soon achievable by PV/CSP due to rapid technology development and reduction of coal-related pollution in power generation for component production process.)
- Pro:
  To set this threshold, for which in none of the activities (technologies) every plant achieves this level, gives incentives to some activities to improve.

b) 0.15

This threshold is achieved by all of analysed wind energy data, most hydropower (all of the recent EPDs), CSP and the best PV and the best performing gas (CC gas plants).

Arguments in favour of this threshold:

- Pro:
  This level can be achieved by more technologies, e.g. best-performing gas power plants, therefore more assets included
- Pro:
  The initial Ramboll study has assessed a high improvement opportunity for the sector energy production and distribution. Identified improvement opportunities for achieving high improvement potential are related to technical and (post-)combustion modification and NOx/SOx removal processes. Having the acidification threshold set at 0.15 would give the opportunity for high performing CCGT with low pollution impact from upstream fuel provision to deliver substantial positive environmental impact on the basis of life-cycle considerations.
- Pro:
  It gives incentives for gas power plants (CCGT: combined-cycle gas turbine) and gas-fired CHP, so they reduce their pollution, in a way that they could contribute to EU objectives.

On the proposed, possible option of exempting wind power from demonstrating SC in case of the threshold level of 0.15:

At this threshold level, wind power could be exempted from proving threshold compliance, because based on the analysed data, it appears that all wind power will achieve this performance level.

c) 0.10

This threshold is achieved by all of recent wind energy (EPD) and all of recent hydropower data (EPDs, they are existing/old power plants); some CSP and some of PV (1 recent plant not), not by gas.

Arguments in favour of this threshold:

- Pro: “compromise solution” between 0.05 and 0.15.

2. Photochemical ozone creation potential: **0.05** kg C2H2 eq per MWh

The proposed threshold is achieved by geothermal, hydro (except 1 source), wind, CSP, most PV, partly by biomass, most natural gas CC.

This parameter covers in particular CO, NOx and VOCs (volatile organic compounds). VOCs are classified into the following categories: alkanes, halogenated HCs, alcohols, ketones, esters, ethers, olefins,

acetylenes, aromatics and aldehydes.

3. Eutrophication potential: **0.05** kg PO43- eq per MWh

The proposed threshold is for PV possible to achieve, achieved by most hydro, achieved by all wind and geothermal as well as CSP; partly achieved by gas CC and PV. The proposed conversion factors are based on Heijungs et al. (1992).

4. PM10: **0.05** kg/per MWh

The proposed threshold is achieved by all wind, all hydro, most gas CC, all EPDs plants.

5. PM2.5: **0.02** kg/per MWh

The proposed threshold is achieved by almost all wind, all hydro, PV most recent data, gas CC.

6. Activity-specific criteria

These parameters, which have been set for DNSH for some of these activities in the Delegated act on climate change mitigation, dealing with specific issues only relevant for certain technologies (e.g. anti-fouling paint and biocides for ocean energy technologies), or to ensure current EU legal minimum environmental performance (e.g. for direct emissions, achieving the BAT-AEL ranges where applicable), **are proposed in addition to the five common overarching SC criteria**.

In the case of power generation from natural gas, the criteria from the activity “4.7 Electricity generation from renewable non-fossil gaseous and liquid fuels” of the climate change mitigation DA were used, because they cover the same legislation that also applies to natural gas-fired power plants (BAT, Medium combustion plant directive).

Pollutants considered, but not included in proposal

Metals and metalloids (As, Cd, Pb; Hg) and PAH: would have been relevant for biomass, but power generation is not proposed as an activity for other reasons (see above); poor data availability for life-cycle emissions of these pollutants was noted.

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3.16 Power from cogeneration of heat/cool and power from biogas

Description of the activity

Construction and operation of installations used for cogeneration of heat/cool and power exclusively from biogas, and excluding cogeneration from blending of renewable fuels with biogas. (as in 4.20 Cogeneration of heat/cool and power from bioenergy, but without bioliquids and biomass and limited to power)

The activity is classified under NACE code D35.11 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

Substantial contribution to pollution prevention and control

The activity complies with all of the following criteria:

1. Acidification potential

Pending decision on the threshold level (see Rationale for details):

Threshold Options:

The life-cycle emissions of pollutants contributing to the acidification potential are lower than…

- **0.05**
- **0.15** (possible exemption: wind power does not have to demonstrate achievement of this threshold)
- **0.10**

… kg SO_2 eq per 1 MWh of electricity output to the power grid or to directly connected customers. The calculation of the acidification potential includes all pollutants relevant for the activity, in particular NO_x, SO_2 and NH_3.

2. Photochemical ozone creation potential:

The life-cycle emissions of pollutants contributing to the photochemical ozone creation potential are lower than **0.05** kg C2H2 eq per 1 MWh of electricity output to the power grid or to directly connected customers. The calculation of the photochemical ozone creation potential includes all pollutants relevant for the activity, in particular CO, NOx and relevant VOCs.

3. Eutrophication potential:

The life-cycle emissions of pollutants contributing to the photochemical ozone creation potential are lower than **0.05** kg PO43- eq per 1 MWh of electricity output to the power grid or to directly connected customers. The calculation of the eutrophication potential includes all pollutants relevant for the activity, in particular NO_x, NH_4^+, N, PO_4^{3-}, P and COD (chemical oxygen demand).

4. Particulate matter PM10:

The life-cycle emissions of PM10 are lower than **0.05** kg/per 1 MWh of electricity output to the power grid or to directly connected customers.

5. Fine particulate matter PM2.5:

The life-cycle emissions of PM10 are lower than **0.02** kg/per 1 MWh of electricity output to the power grid or to directly connected customers.

6. Activity-specific criteria:

For installations falling within the scope of Directive 2010/75/EU, emissions are within or lower than the emission levels associated with the best available techniques (BAT-AEL) ranges set out in the latest relevant best available techniques (BAT) conclusions, including the best available techniques (BAT) conclusions for large combustion plants[377], ensuring at the same time that no significant cross-media effects occur.

[377] Implementing Decision (EU) 2017/1442.

For combustion plants with thermal input greater than 1 MW but below the thresholds for the BAT conclusions for large combustion plants to apply, emissions are below the emission limit values set out in Annex II, part 2, to Directive (EU) 2015/2193.

For plants in zones or parts of zones not complying with the air quality limit values laid down in Directive 2008/50/EC, results of the information exchange[378], which are published by the Commission in accordance with Article 6, paragraphs 9 and 10, of Directive (EU) 2015/2193 are taken into account.

In case of anaerobic digestion of organic material, where the produced digestate is used as fertiliser or soil improver, either directly or after composting or any other treatment, it meets the requirements for fertilising materials set out in Component Material Categories (CMC) 4 and 5 in Annex II to Regulation (EU) 2019/1009 or national rules on fertilisers or soil improvers for agricultural use.

For anaerobic digestion plants treating over 100 tonnes per day, emissions to air and water are within or lower than the emission levels associated with the best available techniques (BAT-AEL) ranges set for anaerobic treatment of waste in the latest relevant best available techniques (BAT) conclusions, including the best available techniques (BAT) conclusions for waste treatment[379]. No significant cross-media effects occur.

Methodology for calculation of criterion 1. Acidification potential, 2. Photochemical ozone creation and 3. Eutrophication based on one of the following:

Life-cycle environmental impacts are calculated using Commission Recommendation 2013/179/EU or, alternatively, using ISO 14025:2010 and ISO 14040:2006 and ISO 14044:2006. Lifecycle environmental impacts are third party verified in according with the procedure described in ISO 14044.

[378] The final technology report resulting from the exchange of information with Member States, the industries concerned and non-governmental organisations contains technical information on best available technologies used in medium combustion plants to reduce their environmental impacts, and on the emission levels achievable with best available and emerging technologies and the related costs (version of [adoption date]: https://circabc.europa.eu/ui/group/06f33a94-9829-4eee-b187-21bb783a0fbf/library/9a99a632-9ba8-4cc0-9679-08d929afda59/details).

[379] Implementing Decision (EU) 2018/1147.

Methodology for splitting of emissions between electricity and heat output from cogeneration (CPH):

Splitting of pollutant emissions between electricity output and heat output is carried out in analogy to Energy Efficiency Directive Annex II (split of pollutants like split of primary energy to the electricity and heat output):

$$m(Poll, el) = m(Poll, total) \frac{\frac{\text{CHP E}\eta}{\text{Ref E}\eta}}{\frac{\text{CHP H}\eta}{\text{Ref H}\eta} + \frac{\text{CHP E}\eta}{\text{Ref E}\eta}}$$

Where:

m(Poll,el) is the emission of a pollutant attributed to the electricity output of the cogeneration plant

m(Poll,total) is the total emission of a pollutant from the cogeneration plant

CHP Hη is the heat efficiency of the cogeneration production defined as annual useful heat output divided by the fuel input used to produce the sum of useful heat output and electricity from cogeneration.

Ref Hη is the efficiency reference value for separate heat production.

CHP Eη is the electrical efficiency of the cogeneration production defined as annual electricity from cogeneration divided by the fuel input used to produce the sum of useful heat output and electricity from cogeneration. Where a cogeneration unit generates mechanical energy, the annual electricity from cogeneration may be increased by an additional element representing the amount of electricity which is equivalent to that of mechanical energy. This additional element does not create a right to issue guarantees of origin in accordance with Article 14(10).

Ref Eη is the efficiency reference value for separate electricity production."

The reference values Ref Hη and Ref Eη (as also referred to in Annex II of the EED) are defined in: Harmonised efficiency reference values 2015 (Commission Delegated Regulation

(EU) 2015/2402), Annex I (separate production of electricity) and Annex II (separate production of heat)[380].

Do no significant harm ('DNSH')

(1) Climate change mitigation	*This criterion is not in the scope of this call for feedback.*
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.
(3) Sustainable use and protection of water and marine resources	DNSH as set out in Appending B of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.
(4) Transition to circular economy	N/A
(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appending D of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.

Rationale

[380] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32015R2402

On the choice of activities (i.e. different technologies) for power generation

The selection includes **activities** for which the conducted analysis shows that they are **in principle capable of fulfilling the proposed TSC**. Depending on the pending decision which SC threshold is selected for the Acidification Potential, not for all proposed activities, evidence was found that they could fulfil the TSC; however, due the available data for life-cycle pollutant emissions are limited, so when in doubt, the activities in question were included in the proposal (e.g. power from geothermal energy).

Nevertheless, other activities (technologies) are not included in the proposal. Power generation using liquid fuels (oil) and biomass were not included because the available data range showed their performance concerning the pollution objective is, by far, insufficient to achieve with the proposed SC thresholds. Therefore it appears unrealistic that currently any aligned assets exist that could be invested in. Hence, these activities are not proposed for the taxonomy.

Both combined heat and power generation (**CHP, cogeneration**) and power generation without heat utilisation are included.

On the criteria for substantial contribution (SC)

For all power generation activities, the same **overarching thresholds for five pollution criteria** are proposed. They address the most significant air pollutant emissions resulting from these activities in the European Union at present. These five criteria cover **life-cycle** emissions, i.e. the value chain until the generated power is delivered to the grid (or to directly connected customers), which includes direct emissions during electricity generation and indirection emissions from upstream stages (fuel production and transport), construction of the power generation facilities and production of the required components.

For **some of the activities, additional criteria** are proposed, to account for environmental specificities of the activity, or to ensure that EU legal requirements, which apply to direct instead life-cycle emissions, are also fulfilled. (These were taken from the DA Climate change mitigation criteria for DNSH concerning the Pollution objective of these activities.)

The proposed **SC threshold levels** result from the analysis of life-cycle pollution data from scientific publications and recent Environmental Product Declarations (EPDs), covering power generation using different technologies.

In the available data sources, the pollutants are either reported by substance (e.g. NOx, SO2, …) or partly combined to **metrics per type of environmental impact** (e.g. the acidification potential, which covers NOx and SO2 and, depending on the methodology, some further acidifying substances which are emitted at lower levels in power generation).

The proposed criteria use the approach of grouping pollutants based on their environmental impact. This choice allows for a lower number of criteria and is already applied in the market, for example due to its application in the EPD methodology for power generation.

The methodology for splitting the emissions between the power output and the heat output, which is required because only the power output of the **CHP** plants is covered by the activities, is proposed in analogy to the Annex II of the Energy Efficiency Directive.

Rationale for choosing the proposed SC criteria and thresholds:

1. Acidification potential (kg SO2 eq per MWh)

Includes SO2 and NOx (and depending on methodology, further pollutants)

Very significant parameter because current emissions from electricity generation are very high. The proposed conversion factors are based on Hauschild & Wenzel, 1998.

Pending decision on the threshold level of Acidification potential:

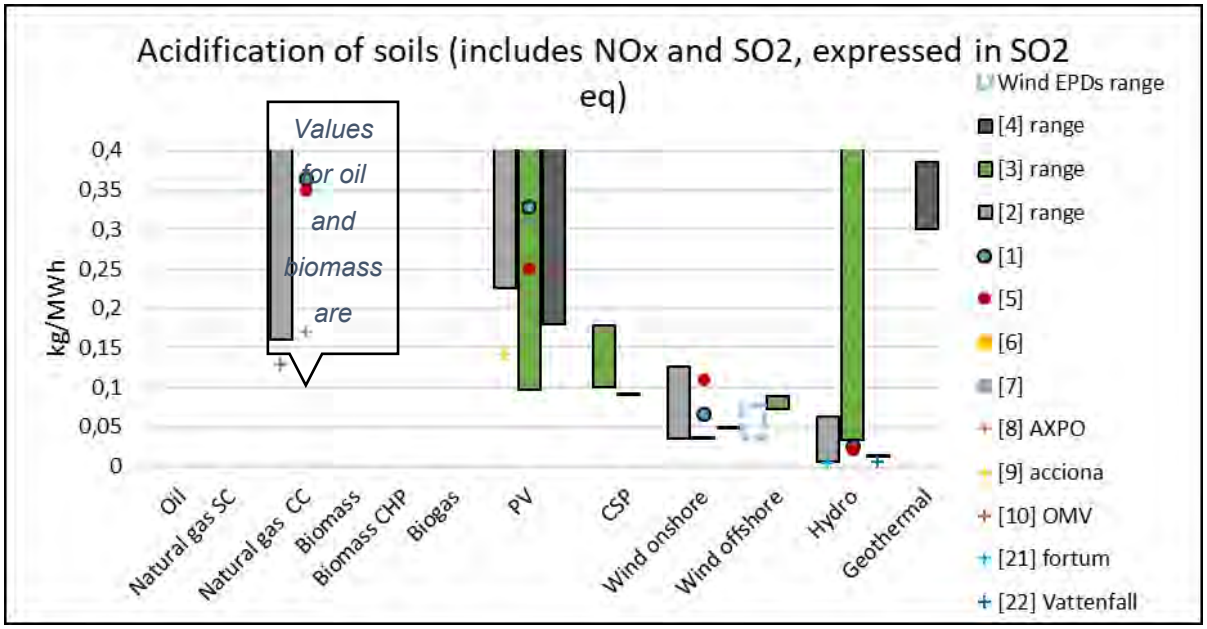
Threshold Options (all expressed in kg SO2 eq per MWh):

a) 0.05

b) 0.15

c) 0.10

The result of the data analysis is shown in the following chart, the arguments for each of the three threshold levels are presented after the chart.



[1] to [7] represent data from scientific publications (filled circles and range bars), [8]-22] represent EPDs (with [11-20] wind power EPDs shown as blue dashed range), [10] Represents NOx and SOx data from emission compliance monitoring & measurement from the power plant and internally calculated pollution data (NOx/SOx) from upstream gas field operation (based on officially reported fuel consumption for gas field operation) from the fuel provision part.

Arguments for the three threshold options:

a) 0.05

This threshold is achieved by a part of literature data (representing somewhat older data) and part of recent wind plant data as well as all recent and part of older hydropower; (currently) not achieved by PV/CSP, geothermal and natural gas.

Arguments in favour of this threshold:

- Pro:
  Evidence is robust that it is possible to generate power by wind power and hydropower at this performance level (i.e. the threshold does not represent a single best performing plant, but is achieved by a range of plants, as shown by different literature sources and recent EPDs).

- Pro:
  This is the most ambitious threshold choice. The PSFs Headline Ambition Level for the Objective “Pollution Prevention and Control” sets 2030 as the target year for

preventing and eliminating pollution. Power plants and infrastructure have a long lifetime, roughly 30 – 100 years. So the current criteria proposals will cover physical infrastructure which will still be largely in operation by 2030 and thus is relevant for achieving the 2030 target. Based on the assessment carried out, it is not possible to fully prevent or eliminate pollution for power generation. However, by this threshold choice, the taxonomy highlights the strongest (currently possible) contributing performing activities to the Headline Ambition.

- Pro:
  In the area of pollution, the Green Deals is very ambitions and specifies “Zero Pollution” at the EU’s target. Likewise, the EC recently published the “Zero pollution action plan”. Therefore is appropriate to set the pollution threshold in the taxonomy, which is a voluntary and transparency instrument, to the most ambitions threshold choice.

- Pro:
  This level is achievable by wind onshore, wind offshore and hydropower, thus not limited to a single technology. (Possibly also soon achievable by PV/CSP due to rapid technology development and reduction of coal-related pollution in power generation for component production process.)

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  To set this threshold, for which in none of the activities (technologies) every plant achieves this level, gives incentives to some activities to improve.

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This threshold is achieved by all of analysed wind energy data, most hydropower (all of the recent EPDs), CSP and the best PV and the best performing gas (CC gas plants).

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- Pro:
  This level can be achieved by more technologies, e.g. best-performing gas power plants, therefore more assets included

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  The initial Ramboll study has assessed a high improvement opportunity for the sector energy production and distribution. Identified improvement opportunities for achieving high improvement potential are related to technical and (post-)combustion modification and NOx/SOx removal processes. Having the acidification threshold set at 0.15 would give the opportunity for high performing CCGT with low pollution impact from upstream fuel provision to deliver substantial positive environmental impact on the basis of life-cycle considerations.

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At this threshold level, wind power could be exempted from proving threshold compliance, because based on the analysed data, it appears that all wind power will achieve this performance level.

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This threshold is achieved by all of recent wind energy (EPD) and all of recent hydropower data (EPDs, they are existing/old power plants); some CSP and some of PV (1 recent plant not), not by gas.

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[18] 2017 EPD Siemens Gamesa G126-2.625 MW onshore wind Europe https://portal.environdec.com/api/api/v1/EPDLibrary/Files/980e5704-760f-4dcf-b569-6cbf1ec9c8de/Data

[19] 2017 EPD Siemens Gamesa G132-3.465 MW onshore wind Europe https://portal.environdec.com/api/api/v1/EPDLibrary/Files/9f2bf099-dbe1-403f-afef-a404a4f99b8f/Data

[20] 2017 EPD Siemens Gamesa G114-2.5 MW onshore wind Europe https://portal.environdec.com/api/api/v1/EPDLibrary/Files/d56d439d-924b-4ef0-9082-08069ca547b7/Data

[21] 2018 EPD fortum, Environmental Product Declaration Krangede Hydropower plant https://portal.environdec.com/api/api/v1/EPDLibrary/Files/5b6257c3-4b17-48b6-b974-c05a93cf2c67/Data

[22] 2021 EPD Vattenfall Nordic Hydropower, Environmental Product Declaration Vattenfalls Nordic Hydropower https://portal.environdec.com/api/api/v1/EPDLibrary/Files/fc28fbf0-21fa-47fc-ab0b-08d8c11ab8a5/Data

4. Civil engineering

For this sector, particular attention should be given to the TSC related to the Circular Economy. For them feedback and inputs are requested related to the project-level data or references that supports or contradicts (e.g. with reference to either technical feasibility, material availability, etc.) the quantitative thresholds proposed (both reuse and recycling and preparation of waste for reuse and recycling) or that support alternative LCA-based thresholds.

4.1 Construction of civil engineering objects

Description of the activity

New construction or reconstruction of civil engineering objects.

The activity is classified under NACE code F42 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

Demolition activities as classified under NACE code F43 are excluded from the scope of this activity

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Substantial contribution to transition to a circular economy

The activity complies with the following criteria:

1. At least 90 % (by weight) of the non-hazardous construction waste* (excluding naturally occurring material referred to in category 17 05 04 in the European List of Waste established by Commission Decision 2000/532/EC479) generated on the construction site is prepared for re-use or recycling.

2. Construction designs and techniques support circularity and in particular demonstrate how they are designed to be more resource efficient, adaptable, flexible and easy to dismantle to enable reuse and recycling. This can be demonstrated with reference to ISO 20887:2020 “Sustainability in buildings and civil engineering works — Design for disassembly and adaptability — Principles, requirements and guidance” or equivalent.

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3. The asset contains at least 30% (by weight) of recycled content, re-used content, re-manufactured content and/or by-products

- provided that this is in accordance with technical standards and;
- provided that the CO_2 emissions generated through the production process and the transportation of the recycled or re-used material are not higher than the CO2 emissions generated through the production process and the transportation of virgin material.**

4. Electronic tools are used to describe the characteristics of the built asset, including the materials and components used, for the purpose of future maintenance, recovery and reuse. The information is stored in a digital logbook or equivalent and is made available to the owner of the asset.

5. Bridges, tunnels, dikes and sluices are equipped with monitoring functions to predict maintenance needs such as in-built predictive maintenance.

*Construction waste is the waste generated through the construction process, excluding excavation and demolition waste.

** The calculation is based on FprEN 17472 or equivalent.

Do no significant harm ('DNSH')

(1) Climate change mitigation	The built asset is not dedicated to the extraction, storage, transport or manufacture of fossil fuels.
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852
(3) Sustainable use and protection of water and marine resources	DNSH as set out in Appending B of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852

(5) Pollution prevention and control	Measures are taken to reduce noise, dust and pollutant emissions during construction works. Where appropriate, given the sensitivity of the area affected, in particular in terms of the size of population affected, noise and vibrations from use of infrastructure are mitigated by introducing open trenches, wall barriers or other measures and comply with Directive 2002/49/EC
(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appending D of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852

Rationale

Environmental hotspots in civil engineering:

Construction has the highest raw material consumption when considering all types of materials together (1.8 billion tons) - mostly non-metallic minerals (Eurostat). No specific figures for civil engineering are available. However, an important share can be presumed as civil engineering represent around 20% of investment in construction (FIEC Statistical Report). This is reflected by figures on the consumption of aggregates. Around 35% of aggregates are used for the construction of civil engineering structures (UEPG). Equally, civil engineering works generate significant amount of waste. By way of illustration, among the construction segments in France, public works generate the highest amount of waste.

Therefore, substantial contribution can be achieved by:

- Improving resource efficiency at the design stage by taking into circularity principles and by using recycled or re-used content.
  - The 30% content is selected based on the ambition in the EU to double the circular material use rate by 2030 (CEAP, 2020) and the availability of recycled material. The

current (2016) rate for non-metallic minerals stands at around 15%[381]. The production of recycled aggregates represents 10,6% of the total aggregate production in the EU and EFTA (UEPG). According to UEPG, even with the total recycling of all construction and demolition waste, it would only cover some 12-20% of the current total demand of aggregates. Aggregates are used as a reference because they are raw materials used in the manufacture of other vital construction products such as ready mixed concrete (made of 80% aggregates), pre-cast concrete products, and asphalt products (made of 95% aggregates). Aggregates are also end-products, e.g. in the case of track ballast or sub-layers of roads. Therefore, in order to comply with this EU circularity ambition, a 30% content is selected.

  - The condition that the use of recycled material must be in accordance with technical standards is necessary because recycled content in construction products might not be permitted or might be subject to a maximum value (%) depending on the use and the exposure of the construction element in question.
  - The calculation of CO2 emissions is necessary because the use of recycled material might have a larger CO2 footprint than the use of virgin raw materials in case it is transported over long distances.
  - *N.B. There is some limited evidence that reused and recycled content thresholds of closer to 50% can be achieved in some Member States. Improved data collection should therefore be undertaken across the EU. This criterion should be reviewed after not more than 2 years and the level of ambition increased or the metrics adapted, for example through introduction of more stringent material-specific targets for certain material types.*

- Increasing the maintainability/recyclability/re-usability by making available information about the built asset
- Preventing the generation of waste during the construction process and during the lifetime of the asset by allowing for targeted and effective maintenance

Achieving a high re-use or recycling or recovery rate of the waste generated. Due to a lack of data at activity level, the starting point for the criterion is Eurostat data referring to country data which is taken as a proxy. The choice of 90% is justified as in 2018, the EU recycled or prepared for re-use 79% of the treated mineral construction and demolition waste. The 90%

[381] page 216 in https://www.eea.europa.eu/publications/soer-2020

will ensure a recycling/re-use rate which is close to 100% but still leaves flexibility for materials which at their end of life do not have the properties to be either recycled or re-used. A 90% rate will also signify a growth of the secondary materials market.

4.2 Civil engineering for climate change adaptation

Description of the activity

The New construction or reconstruction of civil engineering objects.

The activity is classified under NACE code F42 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

Demolition as classified under NACE code F42 are not in the scope of this activity.

Civil engineering works in connection with construction of buildings or for preparation thereof as classified under NACE code F41 or 43 are not in the scope of this activity

Substantial contribution to climate change adaptation

The economic activity has implemented physical and non-physical solutions (‘adaptation solutions’) that substantially reduce the most important physical climate risks that are material to that activity.

2 The physical climate risks that are material to the activity have been identified from those listed in Appendix A to Annex II of the first Delegated Act supplementing Regulation (EU) 2020/852 by performing a robust climate risk and vulnerability assessment with the following steps:

(a) screening of the activity to identify which physical climate risks from the list in Appendix A to Annex II of the Delegated Act may affect the performance of the economic activity during its expected lifetime;

(b) where the activity is assessed to be at risk from one or more of the physical climate risks listed in Appendix A to Annex II of the Delegated Act, a climate risk and vulnerability assessment to assess the materiality of the physical climate risks on the economic activity;

(c) an assessment of adaptation solutions that can reduce the identified physical climate risk.

The climate risk and vulnerability assessment is proportionate to the scale of the activity and its expected lifespan, such that:

(a) for activities with an expected lifespan of less than 10 years, the assessment is performed, at least by using climate projections at the smallest appropriate scale;

(b) for all other activities, the assessment is performed using the highest available resolution, state of-the-art climate projections across the existing range of future scenarios[382] consistent with the expected lifetime of the activity, including, at least, 10 to 30 years climate projections scenarios for major investments.

3. The climate projections and assessment of impacts are based on best practice and available guidance and take into account the state-of-the-art science for vulnerability and risk analysis and related methodologies in line with the most recent Intergovernmental Panel on Climate Change reports[383], scientific peer-reviewed publications and open source[384] or paying models.

4.The adaptation solutions implemented:

(a) do not adversely affect the adaptation efforts or the level of resilience to physical climate risks of other people, of nature, of cultural heritage, of assets and of other economic activities;

[382] Future scenarios include Intergovernmental Panel on Climate Change representative concentration pathways RCP2.6, RCP4.5, RCP6.0 and RCP8.5.

[383] Assessments Reports on Climate Change: Impacts, Adaptation and Vulnerability, published periodically by the Intergovernmental Panel on Climate Change (IPCC), the United Nations body for assessing the science related to climate change produces, https://www.ipcc.ch/reports/.

[384] Such as Copernicus services managed by the European Commission.

(b) favour nature-based solutions[385] or rely on blue or green infrastructure[386] to the extent possible;

(c) are consistent with local, sectoral, regional or national adaptation plans and strategies;

(d) are monitored and measured against pre-defined indicators and remedial action is considered where those indicators are not met;

(e) where the solution implemented is physical and consists in an activity for which technical screening criteria have been specified in this Annex, the solution complies with the do no significant harm technical screening criteria for that activity.

5. In order for an activity to be considered as an enabling activity as referred to in Article 11(1), point (b), of Regulation (EU) 2020/852, the economic operator demonstrates, through an assessment of current and future climate risks, including uncertainty and based on robust data, that the activity provides a technology, product, service, information, or practice, or promotes their uses with one of the following primary objectives:

(a) increasing the level of resilience to physical climate risks of other people, of nature, of cultural heritage, of assets and of other economic activities;

(b) contributing to adaptation efforts of other people, of nature, of cultural heritage, of assets and of other economic activities.

[385] Nature-based solutions are defined as 'solutions that are inspired and supported by nature, which are cost-effective, simultaneously provide environmental, social and economic benefits and help build resilience. Such solutions bring more, and more diverse, nature and natural features and processes into cities, landscapes and seascapes, through locally adapted, resource-efficient and systemic interventions'. Therefore, nature-based solutions benefit biodiversity and support the delivery of a range of ecosystem services (version of [adoption date]: https://ec.europa.eu/info/research-and-innovation/research-area/environment/nature-based-solutions_en/).

[386] See Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Green Infrastructure (GI) — Enhancing Europe's Natural Capital (COM/2013/0249 final).

Do no significant harm ('DNSH')	
(1) Climate change mitigation	The built asset is not dedicated to the extraction, storage (excluding storage of CO_2/CCS – see different activity), transport or manufacture of fossil fuels.
(3) Sustainable use and protection of water and marine resources	The activity complies with DNSH as set out in Appending B of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852 In addition the following requirements must be observed: • An assessment of the water footprint of the activity has been performed • Avoid land-use changes that affect infiltration and evapotranspiration rates and alter runoff (or alternatively restore after civil engineering measures), excessive groundwater, depletion of aquifers Load removal for ductwork by measures for retention and storage of runoff rainwater to protect infrastructures, water, and marine resources if necessary due to danger of overload (e.g., by heavy rain events) or for management and control of the sewage water system.
(4) Transition to a circular economy	• Measures to manage waste, in accordance with the waste hierarchy according to the Waste Framework Directive[387], during construction, in the use phase (maintenance) and at the end-of-life (demolition). • Promote improved environmental performance through the effective use of material and waste management systems. • Rules on re-use, recycling, recovery for non-hazardous construction and demolition waste such as

[387] WasteFD 2008/98/EC

	- at least 79 % (by weight) of the non-hazardous construction waste (excluding naturally occurring material referred to in category 17 05 04 in the European List of Waste established by Commission Decision 2000/532/EC479) generated on the construction site is prepared for re-use or recycling The asset contains at least 15% (by weight) of recycled content, re-used content, re-manufactured content and/or by-products.
(5) Pollution prevention and control	• Measures are taken to reduce noise, dust and pollutant emissions during construction works. • Where appropriate, given the sensitivity of the area affected, in particular in terms of the size of population and fauna affected, noise and vibrations from construction, use and maintenance of infrastructure are mitigated by acoustical planning introducing open trenches, wall barriers or other appropriate measures and comply with the Directive 2002/49/EC. • Construction/building components and materials used in the construction do not contain relevant portions of asbestos nor substances of very high concern as identified on the basis of the list of substances subject to authorisation set out in Annex XIV to Regulation (EC) No 1907/2006 nor substances hazardous to soil and water according to according soil and water protection standards (e.g. EU water framework directive or national groundwater protection regulation). • Where the new construction is located on a potentially contaminated site (brownfield site), the site has been subject to an investigation for potential contaminants, for example using standard ISO 18400.
(6) Protection and restoration of	DNSH as set out in Appending D of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.

biodiversity and ecosystems	Possible additions: • For activities in third countries where Directive 2011/92/EU is not applied, an EIA has been completed in accordance with equivalent national provisions or international standards. Where protective areas protective fauna and flora are affected , an Environmental Integration and a Restoration Plan are developed and implemented in order to restore ecosystems across land and sea after completion of the proper civil engineering measure by measures enabling transformative change taking into account measures like sustainable forest management and avoidance of deforestation, wildlife passages across the construction or Nature-based Solutions (NbS) that protect, sustainably manage, and restore natural or modified ecosystems, that address societal challenges effectively.

Rationale

The main purposes of the activities are to adapt constructions and infrastructures against climate effects like temperature change, influenced groundwater levels, change in permafrost, inland and coastal floods, increase mechanical or other stress to constructions of inland and coastal floods compared to the current situation and or which will require sophisticated and integrated water and resources management.

In parallel civil engineering might provide other sectors with "products", e. g. water infrastructure which is designed and built to be better adapted to future climate, which would then enable the water sector to be more adapted.

Civil engineering also allows to provide infrastructure for low emission transport on water and land. This helps to reduce pollution from transporting activities (e. g. construction of tunnels, railway or underground railways, but also plug in-, charging and filling stations for electricity- and hydrogen-based mobility). In the same way civil engineering can contribute to the other environmental objectives, e. g. infrastructure on circular economy. Thus, the activities contribute to both, adapting constructions and infrastructures and enabling other sectors to become adopted to the raising requirements. In total, this helps to reduce the pressure to environment and natural resources.

For the wide range of activities in civil engineering, adaptation to climate change has several, sometimes contradictory effects that most often are seen in higher resource consumption or

more extensive impacts on the environment. It therefore is necessary to undertake all considerable efforts to reduce these effects.

Against this background, the SC have been taken over from 1st DA and DNSH criteria have been developed on the basis of 1st DA of the Taxonomy Regulation (EU) 2020/852.

Regarding the limits for DNSH for circular economy:

- The 15% content is selected based on the current (2016) rate for non-metallic minerals[388].
- The choice of 79% for high re-use or recycling or recovery rate of the waste generated is justified by the mean portion achieved in 2018[389].

4.3 Maintenance of roads and motorways

Description of the activity

The activity is linked to civil engineering classified under NACE code F42 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

Road maintenance is defined as all actions undertaken to maintain and restore the serviceability and level of service of roads. It includes routine maintenance which can be scheduled on a periodical basis with a view of maintaining a satisfactory level of service and preventive maintenance and rehabilitation which are defined as works undertaken to preserve or restore serviceability and to extend the service life of an existing road

[388] page 216 in https://www.eea.europa.eu/publications/soer-2020

[389] https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_wastrt&lang=en

Substantial contribution to transition to a circular economy

The activity complies with the following criteria:

1. The maintenance operation is mainly dedicated to pavement management and is linked to the following main elements of the road:

-base course and/or

-binder course and/or

-surface course.

2. Where main road elements are demolished, 100% (by weight) of the non-hazardous waste (excluding naturally occurring material referred to in category 17 05 04 in the European List of Waste established by Commission Decision 2000/532/EC479) is prepared for re-use and recycling.

3.Where renewed, the sum of the newly installed road elements contains at least 30% by weight of recycled content, re-used content and/or by-products

-provided that this is in accordance with technical standards and;

-provided that the CO2 emissions generated through the production process and the transportation of the recycled or re-used material are not higher than the CO2 emissions generated through the production process and the transportation of virgin material.*

4. Where renewed, the newly installed binder course has a service lifetime no shorter than 20 years.

Where renewed, the newly installed base course has a service lifetime no shorter than 40 years.

* *The calculation is based on* FprEN 17472 *or equivalent.*

Do no significant harm (‘DNSH’)

(1) Climate change mitigation	A traffic congestion mitigation plan to be implemented during the maintenance works is presented.

(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852
(3) Sustainable use and protection of water and marine resources	DNSH as set out in Appending B of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852
(5) Pollution prevention and control	Measures are taken to reduce noise, dust and pollutant emissions during construction and maintenance works.
(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appending D of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852

Rationale

1) Substantial contribution by maintenance in general

In general, maintenance and repair are key activities in a circular economy as they extend the life of products/assets and optimize their use with the aim of resource value retention and waste reduction (Taxonomy Regulation (EU) 2020/852, JRC Report for developing criteria).

Where road maintenance or repair measures are neglected, major refurbishment works or even the demolition and the reconstruction become necessary. The longer maintenance/repair is neglected the larger the scale of the works needed in order to restore the assets condition. The larger the scale of the works, the higher the amount of new materials used and waste generated.

Illustration with a World Bank's HDM4 simulation for a road: Proper maintenance results in high raw material savings.

The simulation shows different scenarios according to the state of the road. Var 1 is a reconstruction when the road reaches a state (IRI) of 12 (very bad condition). Var 2 is a

rehabilitation when the road reaches a state (IR) of 8 (bad condition). Var 3 and 4 are maintenance operations when the road reaches a satisfactory state (IRI).

IRI = International Roughness Index

Route initiale		Options de maintenance/réhabilitation	Composition des travaux	Volume supplémentaire (m cube de matériaux)	Bitume (tonnes)
longueur (m)	10.000	Rien	-	0	0
largeur (m)	7	Var 1 reconstruction à 12 IRI	30 cm grave, 15 grave bitume, 5 B.B	35.000	1.629
m²	70.000	Var 2 réhabilitation à 8 IRI	15 grave bitume, 5 B.B	14.000	1.629
épaisseur (m)	0,70	Var 3 5 cm B.B à 5 IRI	5 B.B et réparations	4.500	565
Volume de matériau: en mètres cube	**49.000**	Var 4 5 cm B.B à 4 IRI	5 B.B deux fois dans la période	7.000	942
			IRI = International Roughness Index = quality of pavement		
			B.B. = enrobé = coat		
			Grave = aggregates		

Sources: European Commission, World Bank, World Economic Forum

2) Substantial contribution by making road maintenance more circular

The European road network has been developed over centuries, with the majority of the roads having been constructed over the last 100 years. The European road network consists of around 5.5 million km with an estimated value of over €8 trillion (EUPAVE, EAPA).

Progressively road works are switching from new construction to maintenance. About 90% of road construction works are maintenance and network reconstruction works, while only 10% are new infrastructure construction works (Project SustainEuroRoad). Improving the way how maintenance is being executed has therefore a high potential for substantial contribution in terms of circular economy.

By way of illustration, the dominant road pavement construction material used in the bound layers is asphalt. Around 950 billion tonnes of asphalt is currently incorporated in the European road network (EAPA).

The most significant environmental impacts of road maintenance are material production when a maintenance activity leads to the renewal of road elements (EU GPP Criteria) and, as a maintenance activity can be a partial demolition of the road, the generation of waste.

A substantial contribution can therefore be made when the use of raw materials is reduced, a high rate of the demolition waste is recovered and the durability of the renewed road elements is enhanced. The criteria are partly based on the requirements of the EU Green Public Procurement Criteria.

- The 100% recycling/re-use rate is chosen because materials used in the upper layers of roads can be recycled.
- The 30% content is selected based on the ambition in the EU to double the circular material use rate by 2030 (CEAP, 2020) and the availability of recycled material. The current (2016) rate for non-metallic minerals stands at around 15%.The production of recycled aggregates represents 10,6% of the total aggregate production in the EU and EFTA (UEPG). According to UEPG, even with the total recycling of all construction and demolition waste, it would only cover some 12-20% of the current total demand of aggregates. Aggregates are used as a reference because they are raw materials used in the manufacture of other vital construction products such as ready mixed concrete (made of 80% aggregates), pre-cast concrete products, and asphalt products (made of 95% aggregates). Aggregates are also end-products, e.g. in the case of track ballast or sub-layers of roads. Therefore, in order to comply with this EU circularity ambition, a 30% content is selected.
- The condition that the use of recycled material must be in accordance with technical standards is necessary because recycled content in construction products might not be permitted or might be subject to a maximum value (%) depending on the use and the exposure of the construction element in question.
- The calculation of CO2 emissions is necessary because the use of recycled material might have a larger CO2 footprint than the use of virgin raw materials in case it is transported over long distances.

N.B. There is some limited evidence that reused and recycled content thresholds of closer to 50% can be achieved in some Member States. Improved data collection should therefore be undertaken across the EU. This criterion should be reviewed after not more than 2 years and the level of ambition increased or the metrics adapted, for example through introduction of more stringent material-specific targets for certain material types.

Road maintenance activities can have a negative impact on climate change mitigation and congestion when roads or lanes are closed due to the maintenance activity (EU GPP). NB.: Properly maintained roads automatically lead to a reduction in CO2 by reducing rolling resistance (EAPA). The remaining DNSH are taken over from the first delegated act as these already reflect the risks that can be associated to the activity.

3) Funding gap for road maintenance

In addition, European transport road infrastructure faces a significant maintenance backlog (European Commission, European Court of Auditors, national studies) – a funding gap in other

words. Redirecting capital flows in maintenance/repair activities could contribute to solving this situation and avoid the further deterioration of infrastructure which would eventually result in a higher level of raw material consumption and waste generation.

4.4 Maintenance of bridges and tunnels (railway, road and cycling infrastructure)

Description of the activity

The activity is linked to civil engineering classified under NACE code F42 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

Bridge and tunnel maintenance is defined as all actions undertaken to maintain and restore the structural health of the structures and thereby extend their service lives.

Substantial contribution to transition to a circular economy

The activity complies with the following criteria:

1. The maintenance operation documents that it leads to an extension of the service life by

a) remedying defects in the structure which pose a risk to the asset's structural health or;

b) strengthening the asset's loadbearing capacity in order to restore or enhance its strength compared to what was deemed necessary during their design.

2. Where generated, at least 90% of the non-hazardous construction and demolition waste (excluding naturally occurring material referred to in category 17 05 04 in the European List of Waste established by Commission Decision 2000/532/EC479) are prepared for re-use or recycling.

3. The sum of the newly installed elements contains at least 30% by weight of recycled content, re-used content and/or by-products

- provided that this is in accordance with technical standards and;

- provided that the CO2 emissions generated through the production process and the transportation of the recycled or re-used material are not higher than the CO2 emissions generated through the production process and the transportation of virgin material.*

** *The calculation is based on* FprEN 17472 *or equivalent.*

Do no significant harm ('DNSH')

(1) Climate change mitigation	A traffic congestion mitigation plan to be implemented during the maintenance works is presented.
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852
(3) Sustainable use and protection of water and marine resources	DNSH as set out in Appending B of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852
(5) Pollution prevention and control	Measures are taken to reduce noise, dust and pollutant emissions during construction and maintenance works.
(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appending D of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852

Rationale

1) Substantial contribution by maintenance as such

In general, maintenance and repair are key activities in a circular economy as they extend the life of products/assets and optimize their use with the aim of resource value retention and waste reduction (Taxonomy Regulation (EU) 2020/852, JRC Report for developing criteria).

2) Bridge and tunnel maintenance: material savings and durability

It is estimated that there about 1 million bridges and 4,000 km of tunnels in the EU. In 2004, in a study commissioned by the European Commission, the replacement costs of these structures have been estimated at €400 billion and €110 billion respectively (COST 345). Such replacement costs include material costs which illustrates the advantages of avoiding replacement by proper maintenance. Tunnels and bridges falls under the category of infrastructures which consume 15% of aggregates (UEPG). More specific data is, to our knowledge, not available.

Proper maintenance leads to postponing or even avoiding the replacement of such assets and thereby contributes to the reduction in raw material consumption. The notion of durability is linked to the maintenance of these structures. A structure which is not regularly maintained will not offer a proper service for a long time. By way of illustration, in Norway, an undermaintained bridge, at first denied a waterproof membrane costing about US$ 600,000, had to be replaced entirely at a cost of US$ 15 million (World Economic Forum). The collapse of the Morandi Bridge also illustrates the importance of maintenance. In short, maintenance ensures structural health by remedying common pathologies such as steel corrosion. An asset which is properly maintained is theoretically indestructible and the material consumption is limited to maintenance.

3) Explanation of thresholds

- The 30% content is selected based on the ambition in the EU to double the circular material use rate by 2030 (CEAP, 2020) and the availability of recycled material. The current (2016) rate for non-metallic minerals stands at around 15%[1]. The production of recycled aggregates represents 10,6% of the total aggregate production in the EU and EFTA (UEPG). According to UEPG, even with the total recycling of all construction and demolition waste, it would only cover some 12-20% of the current total demand of aggregates. Aggregates are used as a reference because they are raw materials used in the manufacture of other vital construction products such as ready mixed concrete

(made of 80% aggregates), pre-cast concrete products, and asphalt products (made of 95% aggregates). Aggregates are also end-products, e.g. in the case of track ballast or sub-layers of roads. Therefore, in order to comply with this EU circularity ambition, a 30% content is selected.

- The condition that the use of recycled material must be in accordance with technical standards is necessary because recycled content in construction products might not be permitted or might be subject to a maximum value (%) depending on the use and the exposure of the construction element in question.
- The calculation of CO_2 emissions is necessary because the use of recycled material might have a larger CO_2 footprint than the use of virgin raw materials in case it is transported over long distances.

Due to a lack of data at activity level, the starting point for the criterion on the recovery of waste is Eurostat data referring to country data which is taken as a proxy. The choice of 90% is justified as in 2018, the EU recycled or prepared for re-use 79% of the treated mineral construction and demolition waste. The 90% will ensure a recycling/re-use rate which is close to 100% but still leaves flexibility for materials which at their end of life do not have the properties to be either recycled or re-used. A 90% rate will also signify a growth of the secondary materials market.

5. Buildings

5.1 Construction of new buildings and major renovations of buildings for the transition to a circular economy

Description of the activity

New construction or major renovation of buildings.

The activity is classified under NACE code F41 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

Demolition as classified under NACE code F41 are not in the scope of this activity.

Substantial contribution to transition to a circular economy

The activity complies with the following criteria:

1. At least 90 % (by weight) of the non-hazardous construction waste* (excluding naturally occurring material referred to in category 17 05 04 in the European List of Waste established by Commission Decision 2000/532/EC479) generated on the construction site is prepared for re-use or recycling.
2. A life cycle assessment[390] of the entire building or of the renovation works has been calculated according to Level(s) and EN 15978, covering each stage in the life cycle and the results are disclosed to investors and clients on demand.

[390] The GWP is communicated as a numeric indicator for each life cycle stage expressed as kgCO2e/m2 (of useful internal floor area) averaged for one year of a reference study period of 50 years. The data selection, scenario definition and calculations are carried out in accordance with EN 15978 (EN 15978:2011. Sustainability of construction works. Assessment of environmental performance of buildings. Calculation method). The scope of building elements and technical equipment is as defined in the Level(s) common EU framework for indicator 1.2. Where a national calculation tool exists, or is required for making disclosures or for obtaining building permits, the respective tool may be used to provide the required disclosure. Other calculation tools may be used if they fulfil the minimum criteria laid down by the Level(s) common EU framework (version of [adoption date]: https://susproc.jrc.ec.europa.eu/product-bureau/product-groups/412/documents), see indicator 1.2 user manual.

3. Construction designs and techniques support circularity and in particular demonstrate how they are designed to be more resource efficient, adaptable, flexible and easy to dismantle to enable reuse and recycling. This should be demonstrated with reference to Level(s) indicators 2.3[391] (design for adaptability) and 2.4[392] (design for deconstruction) at Level 2, in accordance with ISO 20887:2020, EN 15643, and EN 16309.
4. The asset contains at least 30% (by weight) of recycled content, re-used content, re-manufactured content and/or by-products
   - provided that this is in accordance with technical standards and;
   - provided that the CO2 emissions generated through the production process and the transportation of the recycled or re-used material are not higher than the CO2 emissions generated through the production process and the transportation of virgin material.**
5. The design promotes material and resource efficiency by following relevant national or international standards[393] or best practice design guidance on material efficiency.
6. Components and materials used in the construction do not contain asbestos nor substances of very high concern as identified on the basis of the list of substances subject to authorisation set out in Annex XIV to Regulation (EC) No 1907/2006 of the European Parliament and of the Council unless authorised or exempted for the specific use through the appropriate processes in REACH.
7. Digital tools that support preserving and extending service life and future adaptation and reuse have been deployed to produce, as a minimum:
   - Detailed material specification records as part of a building information model / digital twin or in a separate schedule or material passport, covering at least the structural elements, facades and HVAC equipment.
   - A maintenance schedule including a technical description of the building and its systems and a schedule for future maintenance

[391] https://susproc.jrc.ec.europa.eu/product-bureau//sites/default/files/2020-10/20201013%20New%20Level(s)%20documentation_2.3%20Adaptability_Publication%20v1.0.pdf

[392] https://susproc.jrc.ec.europa.eu/product-bureau/sites/default/files/2021-01/UM3_Indicator_2.4_v1.1_18pp.pdf

[393] For example, BS 8895 Designing for material efficiency in building projects

- For buildings with floor area above 5000m^2, an as-built computer model (digital twin)

All of the above should be held at the site or by the building owner and evidence disclosed to clients and investors on demand.

**Construction waste is the waste generated through the construction process, excluding excavation and demolition waste.*

*** The calculation is based on* FprEN 17472 *or equivalent.*

Do no significant harm ('DNSH')

(1) Climate change mitigation	*This criterion is not in the scope of this call for feedback.*
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852
(3) Sustainable use and protection of water and marine resources	Where installed, except for installations in residential building units, the specified water use for the following water appliances are attested by product datasheets, a building certification or an existing product label in the Union, in accordance with the technical specifications laid down in Appending E of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852: (a) wash hand basin taps and kitchen taps have a maximum water flow of 6 litres/min; (b) showers have a maximum water flow of 8 litres/min; (c) WCs, including suites, bowls and flushing cisterns, have a full flush volume of a maximum of 6 litres and a maximum average flush volume of 3,5 litres;

	(d) urinals use a maximum of 2 litres/bowl/hour. Flushing urinals have a maximum full flush volume of 1 litre. To avoid impact from the construction site, the activity complies with the criteria set out in Appending B of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.
(5) Pollution prevention and control	Building components and materials used in the construction comply with the criteria set out in Appending C of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852. Building components and materials used in the construction that may come into contact with occupiers emit less than 0,06 mg of formaldehyde per m³ of material or component upon testing in accordance with the conditions specified in Annex XVII to Regulation (EC) No 1907/2006 and less than 0,001 mg of other categories 1A and 1B carcinogenic volatile organic compounds per m³ of material or component, upon testing in accordance with CEN/EN 16516 or ISO 16000-3:2011 or other equivalent standardised test conditions and determination methods. Where the new construction is located on a potentially contaminated site (brownfield site), the site has been subject to an investigation for potential contaminants, for example using standard ISO 18400. Measures are taken to reduce noise, dust and pollutant emissions during construction or maintenance works
(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appending D of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852. The new construction is not built on one of the following: (a) arable land and crop land with a moderate to high level of soil fertility and below ground biodiversity as referred to the EU LUCAS survey;

	(b) greenfield land of recognised high biodiversity value and land that serves as habitat of endangered species (flora and fauna) listed on the European Red List or the IUCN Red List; (c) land matching the definition of forest as set out in national law used in the national greenhouse gas inventory, or where not available, is in accordance with the FAO definition of forest.

Rationale

Environmental hotspots in construction:

Construction has the highest raw material consumption when considering all types of materials together (1.8 billion tons) - mostly non-metallic minerals (Eurostat) and is responsible for around a third of all EU waste generated. Around 80% of investment in construction goes into buildings (FIEC Statistical Report) so this segment is especially important for circular economy. Overall, the built environment in Europe is reportedly just “8.6% circular” (Circularity Gap Report, 2021[394]).

Therefore, substantial contribution can be achieved by:

- Improving resource efficiency at the design stage by taking into circularity principles and by using recycled or re-used content. The 30% content is selected based on the ambition in the EU to double the circular material use rate by 2030 (CEAP, 2020). The current (2016) rate for non-metallic minerals stands at around 15%[395]. Therefore, in order to comply with this EU circularity ambition, a 30% content is selected.

N.B. There is some limited evidence that reused and recycled content thresholds of closer to 50% can be achieved in some Member States. Improved data collection should therefore be undertaken across the EU. This criterion should be reviewed after not more than 2 years and the level of ambition increased or the metrics adapted, for example through introduction of more stringent material-specific targets for certain material types.

- Increasing the maintainability/recyclability/re-usability by making available information about the built asset

[394] https://www.circularity-gap.world/2021#downloads

[395] page 216 in https://www.eea.europa.eu/publications/soer-2020

- Preventing the generation of waste during the construction process and during the lifetime of the asset by allowing for targeted and effective maintenance
- Ensuring designs are resource efficient in the first place and avoid overspecification which has been shown to be common for some elements such as structural steel work.
- Achieving a high re-use or recycling or recovery rate of the waste generated. The choice of 90% is justified as in 2018, the EU recycled or prepared for re-use 79% of the treated mineral construction and demolition waste[396]. Therefore in order for this activity to deliver a substantial contribution to the Circular Economy, it should perform better than the average situation in the EU.

5.2 Construction of new buildings and major renovations of buildings for protection and restoration of biodiversity and ecosystems

Description of the activity

Construction of new buildings on brownfield sites[397] and major renovations.

The activity is classified under NACE code F41 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

Activities carried out on greenfield sites[398] or sites which are within or directly adjacent to biodiversity-sensitive areas, including the Natura 2000 network of protected areas, UNESCO

[396] https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_wastrt&lang=en

[397] Land on which development has previously taken place. https://www.eea.europa.eu/help/glossary/eea-glossary/brownfield-site

[398] Land on which no urban development has previously taken place.
https://www.eea.europa.eu/help/glossary/eea-glossary/greenfield-site

World Heritage sites and Key Biodiversity Areas or sites with an equivalent protected status under relevant national laws are excluded under all circumstances.

Substantial contribution protection and restoration of biodiversity and ecosystems

A substantial contribution to biodiversity is considered to have been made when **both criteria A and B** are met:

A

A biodiversity strategy or biodiversity management plan for the site has been produced by a suitably qualified ecologist that respects the mitigation hierarchy[399] and addresses, as a minimum:

1. Measures taken to protect any species found on the site that are classified by the European and IUCN Red Lists[400] as Vulnerable, Endangered or Critically Endangered, including, where appropriate; scheme redesign, relocation of works, changes to work methods or timing, monitoring of species and habitat during and after works and any other measures deemed necessary by the suitably qualified ecologist.
2. An ex-ante assessment of the proposed design measures confirming that these will deliver biodiversity net gain, including a gain in number of native species. The implementation must also be confirmed by an ex-post assessment of the site.
3. Measures to mitigate impacts during the construction phase including phasing or timing of construction works to avoid destruction of active nests or disruption of breeding activities of native species and the attenuation of noise and vibration.
4. A plan for ongoing maintenance of green and biodiversity infrastructure included in the development.
5. Consideration for how the development contributes to the aims and objectives of relevant local, national, regional and international strategies for biodiversity and green infrastructure, including connecting the site to urban green infrastructure networks or corridors, where these exist.

And all green infrastructure features have been designed and installed in line with appropriate best practice guidance (examples are listed in footnotes 401 and 403 below).

[399] https://ec.europa.eu/environment/nature/biodiversity/nnl/index_en.htm

[400] IUCN Red List of Threatened Species: https://www.iucnredlist.org/

B

-At least 60% of the external horizontal surface area (excluding surface area that is required for renewable energy sources in order to comply with mandatory local requirements), is dedicated to natural habitat or biotopes (eg green roofs[401])

-At least 80% of all exposed horizonal surfaces on the site (including roofs[402]) are permeable to water (including open water surfaces).

-Provision has been made of additional biodiversity infrastructure such as artificial, building-integrated nesting boxes for bats and birds and free-standing or building-integrated insect habitats ('insect hotels'). As a minimum, one such feature must be provided per residential unit[403] or per 100m^2 of site for non-residential development.

Compliance may also be demonstrated through the application of a locally applicable Green Space Factor (GSF) [404] method and the appropriate locally defined thresholds for the type of development, provided these are not lower in overall ambition than the above thresholds.

Where not already included in the local Green Space Factor (GSF) method, provision must also be made of additional biodiversity infrastructure such as artificial, building-integrated or free-standing nesting boxes for bats and birds and insect habitats ('insect hotels'). As a minimum, one such feature must be provided per residential unit[405] or per 100m^2 of site for non-residential development.

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[401] Green roofs should be designed in accordance with appropriate best practice guidelines. Examples include: City of Hamburg (2019) Green Roofs - Guidelines for Planning or Buglife (2019) Creating Green Roofs for Invertebrates - a best practice guide

[402] For roofs, the permeability requirement refers to the top or outer surface only, which should be permeable water, eg to facilitate rainwater retention and support habitats, eg for plants, invertebrates etc.

[403] Based on good practice guidance, eg Biodiversity in the Built Environment: Good Practice Guide 1 Preservation of existing nesting sites and provision of artificial nesting sites, Landscape and urban design for bats and biodiversity, FLL Green Roof Guidelines - Guidelines for the Planning, Construction and Maintenance of Green Roofs

[404] A Green Space Factor is a method of determining green infrastructure requirements is used within the policies of many municipalities to set planning requirements for new developments. Massini and Smith (2018) Planning for Green Infrastructure - the Green Space Factor and Learning from Europe

[405] Based on good practice guidance, eg Biodiversity in the Built Environment: Good Practice Guide 1 Preservation of existing nesting sites and provision of artificial nesting sites

Do no significant harm (‘DNSH’)	
(1) Climate change mitigation	*This criterion is not in the scope of this call for feedback.*
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852
(3) Sustainable use and protection of water and marine resources	Where installed, except for installations in residential building units, the specified water use for the following water appliances are attested by product datasheets, a building certification or an existing product label in the Union, in accordance with the technical specifications laid down in Appending E of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852: (a) wash hand basin taps and kitchen taps have a maximum water flow of 6 litres/min; (b) showers have a maximum water flow of 8 litres/min; (c) WCs, including suites, bowls and flushing cisterns, have a full flush volume of a maximum of 6 litres and a maximum average flush volume of 3,5 litres; (d) urinals use a maximum of 2 litres/bowl/hour. Flushing urinals have a maximum full flush volume of 1 litre. To avoid impact from the construction site, the activity complies with the criteria set out in Appending B of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.
(4) Transition to a circular economy	At least 70 % (by weight) of the non-hazardous construction and demolition waste (excluding naturally occurring material referred to in category 17 05 04 in the European List of Waste established by Decision 2000/532/EC) generated on the construction site is prepared for reuse,

	recycling and other material recovery, including backfilling operations using waste to substitute other materials, in accordance with the waste hierarchy and the EU Construction and Demolition Waste Management Protocol. Operators limit waste generation in processes related to construction and demolition, in accordance with the EU Construction and Demolition Waste Management Protocol and taking into account best available techniques and using selective demolition to enable removal and safe handling of hazardous substances and facilitate reuse and high-quality recycling by selective removal of materials, using available sorting systems for construction and demolition waste. Building designs and construction techniques support circularity and in particular demonstrate, with reference to ISO 20887 or other standards for assessing the disassembly or adaptability of buildings, how they are designed to be more resource efficient, adaptable, flexible and dismantleable to enable reuse and recycling.
(5) Pollution prevention and control	Building components and materials used in the construction comply with the criteria set out in Appending C of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852. Building components and materials used in the construction that may come into contact with occupiers emit less than 0,06 mg of formaldehyde per m³ of material or component upon testing in accordance with the conditions specified in Annex XVII to Regulation (EC) No 1907/2006 and less than 0,001 mg of other categories 1A and 1B carcinogenic volatile organic compounds per m³ of material or component, upon testing in accordance with CEN/EN 16516 or ISO 16000-3:2011 or other equivalent standardised test conditions and determination methods. Where the new construction is located on a potentially contaminated site (brownfield site), the site has been subject to an investigation for potential contaminants, for example using standard ISO 18400. Measures are taken to reduce noise, dust and pollutant emissions during construction or maintenance works

Rationale

Land use change and surface sealing are two major drivers of biodiversity loss and construction activities clearly play a key role in both. The EU aims to achieve “no net land take by 2050”. This means avoiding construction in certain areas. On the other hand, there are many ways that sensitive design of buildings and sites can encourage biodiversity and boost natural habitats.

Although some greenfield (undeveloped) sites may have low levels of biodiversity, remediation and regeneration would have a more positive outcome on biodiversity than construction, even if that construction adopted best practices. Hence construction on greenfield sites and sites within protected areas (Natura 2000 etc) is excluded from making a substantial contribution.

New constructions on previously developed land or major renovations can make a substantial contribution by achieving a gain in biodiversity through improving so-called green infrastructure.

Improving biodiversity on a site is a spatially and temporally dynamic process. It should be addressed within the local and regional context[406] and it does not end with the practical completion of the asset – the measures taken must be maintained over time. Due to the complexity of natural systems, especially in urban settings, a combination of quantitative targets and qualitative, practice-based criteria is the most appropriate way to ensure outcomes that can be considered a substantial contribution.

Biodiversity strategy:

Given the complexity and temporal issues around supporting biodiversity in urban settings, a strategy is an essential ingredient for delivering and securing substantial contribution.

Assessing biodiversity impacts has been an element of leading green building certification systems in Europe for many years[407]. The general approach taken here is comparable to these

[406] https://www.eea.europa.eu/themes/sustainability-transitions/urban-environment/urban-green-infrastructure/what-is-green-infrastructure

[407] See eg. BREEAM, DGNB, HQE etc

market leading standards, requiring that third-party expert(s) carry out an assessment. Biodiversity assessment of construction sites can identify existing habitats and species at the planning stages of all new developments and evaluate the potential to improve the value of wildlife[408]. The ambition level set here for the development of a site strategy is set at biodiversity net gain which is considered appropriate for brownfield sites and previously developed land, whereby the impacts of historic habitat loss can be mitigated, contributing to the EU's overall ambition to achieve no net loss.[409]

Quantitative targets:

In addition to the practice-based requirements, quantitative targets relating to some of the main impacts that construction activities have on biodiversity will help strengthen the criteria and also give clarity to economic actors on what a substantial contribution looks like in practical terms. Since land use change and surface sealing are key drivers to mitigate, the quantitative thresholds focus on metrics related to these aspects.

The targets have been set for horizontal surfaces only. This does not preclude the inclusion of vertical solutions like green walls as a means of delivering a net gain in biodiversity and native species. However green walls often require much more active maintenance regimes which may not be kept up in the long term and there is much less evidence on the biodiversity benefits of green wall solutions. This should be reviewed and thresholds expanded to vertical surfaces if the evidence base is strengthened.

Artificial habitats:

Case studies have shown that cities and neighbourhoods with such structures (bird and bat boxes and insect nesting etc) can increase the presence of certain species up to 50%. In addition, they reduce the probability of extinction of others[410].

[408] Opuko A. (2019) *Biodiversity and the built environment: Implications for the Sustainable Development Goals (SDGs*). Resources, Conservation & Recycling 141, 1–7

[409] EU Biodiversity Strategy 2020

[410] Atkins (2019) Green Streets as Habitat for Biodiversity. Chapter 3.15.

There is limited quantitative evidence or data available to assess how much green infrastructure on a given site is adequate to deliver on biodiversity goals. The thresholds proposed here have been set with reference to similar thresholds in planning requirements of leading cities[411] for urban greening.

The Green Space Factor (GSF)[412] is one way of determining green infrastructure requirements for developments that has grown in popularity in European cities. It is used within the policies of municipalities to set requirements that developers must agree to before planning permission for a site is granted, in this way green infrastructure is planned at the earliest stage. The targets set at local level go beyond legislative compliance and are typically aligned with local and national biodiversity strategies. The GSF has been adapted in different ways across Europe. Its adaptability has been one of the reasons why it has been successfully transferred between cities, as it can be altered to suit various political, planning and cultural contexts. This is the approach proposed in option 2 and can be applied where such schemes exist. Later schemes have evolved to recognise the important role of provision of artificial habitats such as bird and bat nesting solutions etc. Recognising the role that locally defined GSF schemes play in driving improved biodiversity and green infrastructure within the taxonomy will contribute both to the ambition to ensure Europe's biodiversity will be on the path to recovery by 2030 and the goal to adopt ambitious Urban Greening Plans for cities with at least 20,000 inhabitants.[13]

5.3 Acquisition and ownership of buildings

Description of the activity

Buying real estate and exercising ownership of that real estate. The economic activities in this category could be associated with NACE code L68 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006

[411] For example Hamburg, Toronto, London etc

[412] Massini and Smith (2018) Planning for Green Infrastructure - the Green Space Factor and Learning from Europe.

Substantial contribution to the protection and restoration of biodiversity and ecosystems

A substantial contribution to biodiversity is considered to have been made when **criteria A, B and C** are met:

A

A biodiversity strategy or biodiversity management plan for the site has been produced by a suitably qualified ecologist that respects the mitigation hierarchy[413] and addresses, as a minimum:

1. Measures taken to protect any species found on the site that are classified by the European and IUCN Red Lists[414] as Vulnerable, Endangered or critically endangered, including, where appropriate; protective barriers and/or signage around habitats, guidance for site users and contractors etc. and any other measures deemed necessary by the suitably qualified ecologist.
2. A plan for ongoing maintenance of green and biodiversity infrastructure included in the development.
3. Consideration for how the development contributes to the aims and objectives of relevant local, national, regional and international strategies for biodiversity and green infrastructure, including connecting the site to urban green infrastructure networks or corridors, where these exist.

And all green infrastructure features have been designed and installed in line with appropriate best practice guidance (examples are listed in footnotes 415 and 417 below).

B

[413] https://ec.europa.eu/environment/nature/biodiversity/nnl/index_en.htm

[414] IUCN Red List of Threatened Species: https://www.iucnredlist.org/

-At least 60% of the external horizontal surface area (excluding surface area that is required for renewable energy sources in order to comply with mandatory local requirements), is dedicated to natural habitat or biotopes (eg green roofs[415])

-At least 80% of all exposed horizonal surfaces on the site (including roofs[416]) are permeable to water (including open water surfaces, eg ponds etc.).

-Provision has been made of additional biodiversity infrastructure such as artificial, building-integrated or free-standing nesting boxes for bats and birds and insect habitats ('insect hotels'). As a minimum, one of each such feature deemed appropriate for the location by the suitably qualified ecologist must be provided per residential unit[417] or per 100m2 of site for non-residential development.

Compliance may also be demonstrated through the application of a locally applicable Green Space Factor (GSF) [418] method and the appropriate locally defined thresholds for the type of development, provided these are not lower in overall ambition than the above thresholds.

Where not already included in the local Green Space Factor (GSF) method, provision must also be made of additional biodiversity infrastructure such as artificial, building-integrated nesting boxes for bats and birds and free-standing or building-integrated insect habitats ('insect hotels') as per the requirement above.

C

At the point of acquisition, and every two years thereafter, the compliance with the biodiversity management plan or equivalent instrument and the continued compliance with the thresholds

[415] Green roofs should be designed in accordance with appropriate best practice guidelines. Examples include: City of Hamburg (2019) Green Roofs - Guidelines for Planning or Buglife (2019) Creating Green Roofs for Invertebrates - a best practice guide

[416] For roofs, the permeability requirement refers to the top or outer surface only, which should be permeable water, eg to facilitate rainwater retention and support habitats, eg for plants, invertebrates etc.

[417] Based on good practice guidance, eg Biodiversity in the Built Environment: Good Practice Guide 1 Preservation of existing nesting sites and provision of artificial nesting sites, Landscape and urban design for bats and biodiversity, FLL Green Roof Guidelines - Guidelines for the Planning, Construction and Maintenance of Green Roofs

[418] A Green Space Factor is a method of determining green infrastructure requirements is used within the policies of many municipalities to set planning requirements for new developments. Massini and Smith (2018) Planning for Green Infrastructure - the Green Space Factor and Learning from Europe

set out in criteria B above are controlled by either the relevant national competent authorities or by an independent third-party certifier, at the request of national authorities or the asset owner. The independent third-party certifier may not have any conflict of interest with the owner or the funder, and may not be involved in the development or operation of the activity. In order to reduce costs, audits may be performed together with any green building certification scheme or other audit.

Do no significant harm ('DNSH')	
(1) Climate change mitigation	*This criterion is not in the scope of this call for feedback.*
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852
(3) Sustainable use and protection of water and marine resources	*This criterion is not in the scope of this call for feedback.*
(4) Transition to a circular economy	*This criterion is not in the scope of this call for feedback.*
(5) Pollution prevention and control	*This criterion is not in the scope of this call for feedback.*

Rationale
Land use change and surface sealing are two major drivers of biodiversity loss and construction activities clearly play a key role in both. The EU aims to achieve "no net land take

by 2050". This means avoiding construction in certain areas. On the other hand, there are many ways that sensitive design of buildings and sites can encourage biodiversity and boost natural habitats.

Recognising the role that existing buildings that are designed with features supporting biodiversity is an important part of ensuring that biodiversity decline can be reversed in line with the EU Biodiversity Strategy.

The criteria set here reflect those developed for new construction and major renovation and the rationale for these is explained in that template. Supporting biodiversity on a site is a spatially and temporally dynamic process[419] and hence the criteria are supplemented here with a further requirement to monitor the ongoing compliance over time.

5.4 Demolition or wrecking of buildings and other structures

Description of the activity

The activity is classified under NACE code F43.1.1 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

Substantial contribution to transition to a circular economy

1. The demolition is carried out in accordance with the checklist of the EU Demolition and Construction Waste Protocol or an equivalent at national level.
2. At least 90 % (by weight) of the non-hazardous demolition waste (excluding naturally occurring material referred to in category 17 05 04 in the European List of Waste established by Commission Decision 2000/532/EC479) is prepared for re-use or recycled.

[419] https://www.eea.europa.eu/themes/sustainability-transitions/urban-environment/urban-green-infrastructure/what-is-green-infrastructure

Do no significant harm ('DNSH')	
(1) Climate change mitigation	N/A
(2) Climate change adaptation	N/A
(3) Sustainable use and protection of water and marine resources	DNSH as set out in Appending B of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852
(5) Pollution prevention and control	Measures are taken to reduce noise, dust and pollutant emissions during demolition works.
(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appending D of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852

Rationale

Substantial contribution

- Construction and Demolition Waste is the largest waste stream in the EU in terms of mass (374 million tonnes in the EU-28, in 2016, excluding excavated soil). Most of it is waste resulting from the demolition of built assets, while waste from construction site represents a minor share.
- Instead of being a source for the generation of waste, a qualitative and a quantitative approach to demolition can ensure that built assets serve as source for secondary materials.
- This is translated by increasing the waste recovery rate to 90% and by excluding backfilling. Due to a lack of data at activity level, the starting point for the criterion is Eurostat data referring to country data which is taken as a proxy. The choice of 90% is justified as in

2018, the EU recycled or prepared for re-use 79% of the treated mineral construction and demolition waste. The 90% will ensure a recycling/re-use rate which is close to 100% but still leaves flexibility for materials which at their end of life do not have the properties to be either recycled or re-used. A 90% rate will also signify a growth of the secondary materials market. The exclusion of backfilling is justified through the fact that soil and stones, materials that are most suitable for backfilling, are excluded from the scope of the recovery rate.

- A process which enables high-quality recycling and reuse is ensured by making the use of the EU Construction and Demolition Waste Protocol mandatory. Thereby, amongst others, a pre-demolition audit, selective demolition (including the separate removal of hazardous waste) and sorting of waste are ensured.

DNSH criteria

- Risk for climate change mitigation stemming from the demolition of built assets are linked to the transportation of waste. This aspect is already covered by the EUCDW Protocol. Therefore, no additional criterion is relevant here.
- The demolition does not pose risks to climate change adaptation.

For the other environmental objectives, the criteria have been aligned with the DNSH criteria from the first delegated act as these already reflect the risks that can be associated with demolition activities.

6. ICT

6.1 Digital solutions exploiting space-based earth observations enabling climate change mitigation

Description of the activity

The activity covers the development of digital solutions related to the exploitation of space-based earth observations through processing, modelling, artificial intelligence, data long-term preservation aimed at the provision of information services, data and analytics to targeted audience to monitor GHG emissions and enabling the development of technologies and best practices to master GHG emissions avoidance, reduction and removals (by the public and private sector).

The activity is classified under NACE codes J58.2, J61, J62, J63.1.1, M71, M72 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

The activity is an enabling activity as referred to in Article 10(1), point (i), of Regulation (EU) 2020/852 where it complies with the technical screening criteria set out in this Section.

Substantial contribution to climate change mitigation
The activity complies with the following criteria:
1. The ICT solutions are built on ‘remote sensing from space’ technologies, possibly combined with additional sensing technologies (IoT, in-situ sensing, aerial, …) and provide data and analytics (added-value information) in terms of GHG emissions or removal monitoring, or relevant for the development of clean energies and land use / urban planning practices reducing the GHG footprint.

The ICT solutions deliver information to support the quantification of GHG will they be anthropogenic or natural and emitted or removed from land, soil, vegetation, ocean and waters, human activities or infrastructures. It can eventually support the NDC[420] evaluation.

ICT solutions support human practices or land use planning contributing to the Paris agreement target such as the development of clean or renewable energy, smart mobility reducing carbon footprint, climate-friendly agroforestry including afforestation/reforestation, management of lands having a direct role in GHG emissions/sinks (e.g.: specific crop lands, grasslands, wetlands, mangroves and marshes…), .

ICT solutions support the detection of illegal or harmful practices such as (but not limited to) deforestation forest degradation, illegal burning.

2. ICT solutions can include the:

Processing of observation of GHG by means of imagery, remote sensing to support the quantification of GHG in air, soil, vegetation oceans and waters

The continuous monitoring of hotspots suspect of GHG emissions or designed as carbon sinks in near real-time or regular intervals to support CHG stock take assessment through processing, modelling or AI techniques;

The prediction at short to medium term of GHG emissions, removals or dispersal due to air or water transport

The analysis of long time series of remotely sensed observations to assess trends in GHG emissions in water, oceans, air, vegetation and soil and its variability along time

Simulations and projections of changes in GHG concentrations due to climate change or man-made actions, thanks to modelling, artificial intelligence and data analytics techniques

Digital fusion of earth observation data with additional sources of information (e.g. In-situ, socio-economic, …) to develop added-value services specially in terms of land use and urban planning to support the deployment of clean energies, smart mobility, GHG friendly agroforestry and any relevant activity compliant of the taxonomy of climate change mitigation.

[420] NDC : National Determined Contribution to Paris Agreement

The development and production of indicators related to the implementation of the Paris Agreement by EU policies

Activities aimed at controlling and/or improving the quality of the environmental information processed and delivered (e.g. quality control, reduction of uncertainties, quality reporting…)

Digital solutions enabling the access to the relevant space-based (earth observation) information by the public and private sectors or citizen (including web portals, mobile applications, social media publication, …) to encourage best practices related to GHG emissions reduction.

Dissemination of information based on space-based earth observation related to GHG and best practices in favour of Paris Agreement, to targeted audience (excluding brokering) like the private sector, citizen, local public actors to foster the development of related best practices and policies.

3. The ICT enabling solutions supporting the development of human best practices (point2) need to demonstrate that the activity supported significantly contributes to GHG management (reduction, avoidance, removal, development of sinks).

4. The ICT solutions demonstrate of the quality status of the information provided with associated uncertainties. The ICT solutions are required to deliver information documented in terms of conditions of use, quality standard, quantitative quality assessment, robustness and integrity (traceability of methodology, process, data handling) and compliant with state-of-art standards (e.g. metadata, format, SW plug-ins,…).

Do no significant harm (‘DNSH’)

(2) Climate change adaptation	To be determined
(3) Sustainable use and protection of	To be determined

water and marine resources	
(4) Transition to a circular economy	To be determined
(5) Pollution prevention and control	To be determined
(6) Protection and restoration of biodiversity and ecosystems	To be determined

Rationale

The use of earth observation data is a key enabler in the creation of metrics that are **comparable and available worldwide.** The frequent launch of new satellites increases the number of available earth observation data. In addition, new generations of satellites come with more precise sensors and higher resolutions. These technological advances will allow the scientific community to track the criteria in a more precise and granular manner. Indeed, as mentioned at the end of the document the information and data delivered **have uncertainties linked to the observation and analysis.** The spatial resolution of the satellite images will be key in the use of the indicators by the targeted actors

6.2 Digital solutions exploiting space-based earth observations enabling climate change adaptation

Description of the activity

The activity covers the development of digital solutions related to the exploitation of space-based earth observations through processing, modelling, artificial intelligence, data long-term preservation aimed at the provision of information services, data and analytics to economic actors to make their economic activity resilient to climate risk, their environment, assets and people protected against climate risks, thanks to preventive solutions and better preparedness.

The activity is classified under NACE codes J58.2, J61, J62, J63.1.1, M71, M72, in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006, as far as these relate to digital solutions exploiting space-based earth observations specifically.

The activity is an enabling activity as referred to in Article 10(1), point (i), of Regulation (EU) 2020/852 where it complies with the technical screening criteria set out in this Section.

Substantial contribution to climate change adaptation

The activity complies with the following criteria:

1. The ICT solutions are built on 'remote sensing from space' technologies, possibly combined with additional sensing technologies (IoT, in-situ sensing, aerial) and provide data and analytics (added-value information) to:

- Observe, predict at short to long term possible climate risks and their potential impact on nature, people, economy and goods
- Enable economic actors to protect and adapt their activity (assets, environment, infrastructures and processes) to prevent them from such climate risks and their potential damages by adopting new development, protection and prevention strategies based on science
- Enable the public sector in supporting economic actors to adapt to climate change through relevant land use and urban planning strategies.

2. To support the identification and characterisation of potential risks due to climate change ICT solutions built on ‘remote sensing from space’ technologies include the:

- The processing of observation that enable the detection of a risk associated to climate change, or the monitoring of its evolution will it be sudden (e.g. weather extreme event) or of slow development (e.g. subsidence, desertification), and associated damages (e.g. flood extent, burnt areas)
- The short-term or seasonal prediction of risk occurrence and intensity, and potential areas and period of vulnerability (period and geographical extent of a potential damage to nature or people and goods)
- The analysis of long time series of remotely sensed observations and additional in-situ, environmental or socio-economic observation to assess trends in risk occurrence, intensity, repetitivity and potential areas and periods of vulnerability
- The characterisation of a risk as being driven by climate change to support public decision making and policy implementation
- Simulations and projections of over long periods (decadal, centennial) of extreme events and risk due to climate change with an estimate of potential areas and period of vulnerability.

3. To support prevention of damages by economic actors and the development of climate change adaptation strategies by them, the ICT solutions built on ‘remote sensing from space’ technologies include:

- The continuous monitoring of hotspots suspects to recurrent climate risks in near real-time or regular intervals to support the development of adaptation strategies through processing, modelling or AI techniques
- The development of simulation capacities to assess climate adaptation scenarios (including land use, urban planning, economic development, preventive technologies) and their impact on people, nature or assets before adoption
- The characterisation of potential connectivity or cascading effects between risks that could be induced by prevention or adaptation strategies to prevent possible negative impacts of adaptation measures at short to long-term
- The processing, modelling or AI of space-based observation together with socio-economic data or relevant additional data to characterise vulnerabilities of economic actors against known or simulated risks

- The processing, modelling or AI of space-based observation together with socio-economic data or relevant additional data to develop added-value services especially in terms of land use and urban planning that protects nature, economic goods and people against known or simulated climate risks.
- The dissemination of the information produced by the ICT solutions to targeted audience (excluding brokering) like the private sector, citizen, local public actors to foster the development of related best practices.

4. The ICT solutions delivering data and information demonstrate of their quality status with associated uncertainties. The ICT solutions are required to deliver information documented in terms of conditions of use, quality standard, quantitative quality assessment, robustness and integrity (traceability of methodology, process, data handling) and compliant with state-of-art standards (e.g. metadata, format, SW plug-ins).

Do no significant harm ('DNSH')

(1) Climate change mitigation	To be determined
(3) Sustainable use and protection of water and marine resources	To be determined
(4) Transition to a circular economy	To be determined
(5) Pollution prevention and control	To be determined
(6) The protection and restoration of	To be determined

biodiversity and ecosystems	

Rationale

The use of earth observation data is a key enabler in the creation of metrics that are comparable and available worldwide.

The frequent launch of new satellites increases the number of available earth observation data. In addition, new generations of satellites come with more precise sensors and higher resolutions. These technological advances will allow the scientific community to track the criteria in a more precise and granular manner. Indeed, as mentioned at the end of the document the information and data delivered have uncertainties linked to the observation and analysis. The spatial resolution of the satellite images will be key in the use of the indicators by the targeted actors.

6.3 Digital solutions exploiting space-based earth observations enabling the protection and restoration of biodiversity and ecosystems

Description of the activity

The activity covers the development of digital solutions related to the exploitation of space-based earth observations through processing, modelling, artificial intelligence, data long-term preservation aimed at the provision of information services, data and analytics to targeted audience for decision making (by the public and private sector) enabling protection and restoration of biodiversity and ecosystems.

The activity is classified under NACE codes J58.2, J61, J62, J63.1.1, M71, M72 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

The activity is an enabling activity as referred to in Article 10(1), point (i), of Regulation (EU) 2020/852 where it complies with the technical screening criteria set out in this Section.

Substantial contribution to protection and restoration of biodiversity and ecosystems

The activity complies with the following criteria:

1. The list of relevant ICT solutions is described below and include activities related to the research, development, production and dissemination of information services to final users (e.g.: manufacturing industry, public administrations, farmers, natural parks, associations of conservation).

- The ICT solutions are built on data 'remotely sensed from space', possibly combined with additional sensing technologies (IoT, in-situ sensing, aerial, …)
- ICT solutions exploit these sources of data thanks to processing, modelling or AI technologies to create added-value information
- They are predominantly used for the provision of data and analytics (added-value information) supporting decision-making and policies implementation related to the environmental objective.
- The ICT solutions can deliver information and knowledge related to the understanding and characterisation of biodiversity and ecosystems behaviour and their monitoring in time and space.
- The ICT solutions can deliver information to assess environmental status in which the biodiversity or ecosystem live. The Information about GES has to be pertinent and significant for the ecosystem studies and it has to be demonstrated based on state-of-art science. They can help identify which are the environmental and human pressure affecting the biodiversity and ecosystems health, the possible presence of pollutants, climate risks, economic activity that can affect the biodiversity and ecosystems.
- Coupled with socio-economic and human science and data, the ICT solutions can deliver information and knowledge to identify potential harmful activities or situations in order to prevent them or reduce them (from human pressures but also from natural climate risks).
- ICT solutions can link with social economic and human sciences to support the simulation or development of socio-economic scenarios that help establish sustainable best practices and measure the achievements unambiguously
- The ICT solutions can deliver environmental information that can help in the implementation and evaluation of conservation or restoration actions

- They also help analysing information on biodiversity and ecosystems along time to see changes and to assess the efficiency of policies implementation and conservation/restoration measures.
- Simulation capabilities can help predicting evolution according to scenarios or in case of changes in the earth environment due to climate change.
- ICT solutions can inform of potential connectivity and dependencies of human activities (economic or not) that can affect positively or negatively biodiversity and ecosystems. The impact has to be demonstrated based on state-of-art science and quantified/qualified.
- ICT solutions include the support to the design, exploitation, monitoring of marine protected areas, green corridors, natura2000 sites, natural parks, sanctuaries as recommended by EU and international policies (e.g. Convention on Biological Diversity, Marine Strategy Framework Directive, EU biodiversity strategy…) and reporting on its conservation status
- ICT solutions can contribute to the evaluation of quality and uncertainties in environmental information developed from space earth observation data and analytics
- ICT can address the production of indicators quality-controlled and based on established methodology to assess the conservation status of biodiversity and ecosystems or the effectiveness of sustainable activities, supporting at best policies reporting, possibly downscaled at national to local level as appropriate to support national regulations
- The ICT solutions include the dissemination of information based on space-based earth observation to targeted audience (excluding brokering) like the private sector, citizen, local public actors to foster the development of best practices, responsible behaviour, citizen science and policies implementation.

2. Information services developed in favour of sustainable practices, recovery or conservation scenario need to demonstrate of their effectiveness based on published science and quality flags, established methodologies.

The ICT solutions demonstrate of the quality status of the information provided with associated uncertainties. The ICT solutions are required to deliver information documented in terms of conditions of use, quality standard, quantitative quality assessment, robustness and integrity (traceability of methodology, process, data handling) and compliant with state-of-art standards (e.g. metadata, format, SW plug-ins,…).

Do no significant harm (‘DNSH’)

(1) Climate change mitigation	To be determined
(2) Climate change adaptation	To be determined
(3) Sustainable use and protection of water and marine resources	To be determined
(4) Transition to a circular economy	To be determined
(5) Pollution prevention and control	To be determined

Rationale

The use of earth observation data is a key enabler in the creation of metrics that are comparable and available worldwide.

The frequent launch of new satellites increases the number of available earth observation data. In addition, new generations of satellites come with more precise sensors and higher resolutions. These technological advances will allow the scientific community to track the criteria in a more precise and granular manner. Indeed, as mentioned at the end of the document the information and data delivered have uncertainties linked to the observation and analysis. The spatial resolution of the satellite images will be key in the use of the indicators by the targeted actors.

6.4 Digital solutions exploiting space-based earth observations enabling pollution prevention and control

Description of the activity

The activity covers the development of digital solutions related to the exploitation of space-based earth observations through processing, modelling, artificial intelligence, data long-term preservation aimed at the provision of information services, data and analytics to targeted audience for decision making (by the public and private sector) enabling pollution prevention, monitoring and control.

The activity is classified under NACE codes J58.2, J61, J62, J63.1.1, M71, M72 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

The activity is an enabling activity as referred to in Article 10(1), point (i), of Regulation (EU) 2020/852 where it complies with the technical screening criteria set out in this Section.

Substantial contribution to pollution prevention and control

The activity complies with the following criteria:

1. The ICT solutions are built on 'remote sensing from space' technologies, possibly combined with additional sensing technologies (IoT, in-situ sensing, aerial, …) and are predominantly used for the provision of data and analytics (added-value information) relevant for decision-making in terms of pollution prevention, monitoring and control related to air, inland waters, seas and oceans and soil.

2. ICT solutions include :

- Processing of observation of pollution by means of imagery, remote sensing (ex: oil, plastics, containers at sea, dust, wastes, metals, minerals…) to support pollution control, cleaning and law enforcement
- Monitoring of environmental quality and biogeochemical composition of air, water, oceans and soil in near real-time or regular intervals to support pollution control and law enforcement through processing, modelling or AI techniques

- Short-term prediction of environmental quality and biogeochemical composition of water, air, oceans and soil for pollution prevention
- Analysis of long time series of remotely sensed observations to assess trends in environmental quality or water, oceans, air and soil and variability along time to support pollution prevention
- Simulations and projections of changes in the biogeochemical quality of water , air, oceans and soil due to climate change or man-made pressures, thanks to modelling, artificial intelligence and data analytics techniques
- Digital fusion of earth observation data with additional sources of information (e.g. in-situ, socio-economic, …) to develop added-value services directly of use for policy implementation by the public and private sector or policy enforcement
- Development and production of environmental indicators supporting SDGs and policies monitoring and implementation like the implementation of Good Environmental Status, SDG indicators (e.g. policies such as MSFD, WFD, sulphur directive, ambient air quality directive, national soil directives…)
- Activities aimed at controlling and/or improving the quality of the environmental information processed and delivered (e.g. quality control, reduction of uncertainties, quality reporting…)
- Digital solutions that enable the access to space-based (earth observation) information related to pollution prevention, detection, control and reduction by the public and private sectors or citizen (including web portals, mobile applications, social media publication, …) to encourage best practices related to pollution reduction.

3. The ICT solutions delivering data and information demonstrate of pollution or environmental quality status with associated uncertainties linked to the observation and analysis. The ICT solutions are required to deliver information documented in terms of conditions of use, quality standard, quantitative quality assessment, ensure enough documentation to demonstrate of robustness and integrity (traceability of methodology, process, data handling), be compliant with state-of-art standards (e.g. metadata, format, SW plug-ins,…).

Do no significant harm (‘DNSH’)

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(1) Climate change mitigation	To be determined
(2) Climate change adaptation	To be determined
(3) Sustainable use and protection of water and marine resources	To be determined
(4) Transition to a circular economy	To be determined
(6) The protection and restoration of biodiversity and ecosystems	To be determined

Rationale

The use of earth observation data is a key enabler in the creation of metrics that are comparable and available worldwide.

The frequent launch of new satellites increases the number of available earth observation data. In addition, new generations of satellites come with more precise sensors and higher resolutions. These technological advances will allow the scientific community to track the criteria in a more precise and granular manner. Indeed, as mentioned at the end of the document the information and data delivered have uncertainties linked to the observation and analysis. The spatial resolution of the satellite images will be key in the use of the indicators by the targeted actors.

6.5 Digital solutions exploiting space-based earth observations enabling sustainable use of waters and marine resources, and their protection

Description of the activity

The activity covers the development of digital solutions related to the exploitation of space-based earth observations through processing, modelling, artificial intelligence, data long-term preservation aimed at the provision of information services, data and analytics to targeted audience for decision making (by the public and private sector) enabling pollution prevention, monitoring and control.

The activity is classified under NACE codes J58.2, J61, J62, J63.1.1, M71, M72 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

The activity is an enabling activity as referred to in Article 10(1), point (i), of Regulation (EU) 2020/852 where it complies with the technical screening criteria set out in this Section.

Substantial contribution to sustainable use of waters and marine resources, and their protection

The activity complies with the following criteria:

1. The ICT solutions include activities related to the research, development, production and dissemination of information services to final users (e.g.: manufacturing industry, public administrations, engineering companies, …) as described below. NB: By marine resources is understood any non-living (e.g. minerals) or living resource (e.g. algae, fish…) that can be exploited or protected.

- The ICT solutions are built on data 'remotely sensed from space', possibly combined with additional sensing technologies (IoT, in-situ sensing, aerial, …) and are predominantly used for the provision of data and analytics relevant for decision-making in terms of sustainable exploitation of inland waters and marine resources or their protection.
- ICT solutions exploit these sources of data thanks to processing, modelling or AI technologies to create added-value information

- The ICT solutions can deliver information on the quality and quantity of water and marine resources
- The ICT solutions can deliver information to assess good environmental status related to waters seas and oceans. They help identify the possible presence of biogeochemical pollutants possibly including their sources and characteristics, at a given time and their dispersal. These pollutants can be due to man-made activities (e.g. plastics, nitrates, metals) or due to climate change (e.g. acidification).
- They also help analysing this information along time to see changes in pollution presence and patterns. They help simulating or predicting its evolution according to policies scenarios or in case of changes in the earth environment due to climate change.
- The ICT solutions can deliver information on risks related to water and marine resources either incurred by them or developing from water and marine resources, such as natural risks at coast, health risks due to pollution and contaminants (short-term risk forecasts, impact forecasts , monitoring of evolution and consequences, monitoring of recovery to a normal situation, excluding climate-related risks targeted by a different taxonomy)
- ICT solutions can provide information on the dependencies from inland waters, seas and oceans to land activities that can impact the water and marine resources specially in terms of pollution and adverse impacts (e.g. artificialisation, civil engineering, industrial activity…), identification of land sources
- ICT solutions can provide information on the dependencies between the environment and marine resources (specially living resources) that can be affected by possible anthropogenic or natural changes in water quantity and quality
- ICT solutions can support the production of environmental indicators as defined by EU policies or SDGs , possibly downscaled at national to local level as appropriate to support national regulations
- ICT solutions can link with social economic and human sciences to support the development of socio-economic scenarios that help establish sustainable best practices and measure the achievements unambiguously
- ICT solutions can contribute to the evaluation of quality and uncertainties in environmental information developed from space earth observation data and analytics
- ICT solutions can include the dissemination of information based on space-based earth observation to targeted audience (excluding brokering) like the private sector, citizen, local public actors to foster the development of best practices and policies implementation.

2. The ICT solutions demonstrate of the quality status of the information provided with associated uncertainties. The ICT solutions are required to deliver information documented in terms of conditions of use, quality standard, quantitative quality assessment, robustness and integrity (traceability of methodology, process, data handling) and compliant with state-of-art standards (e.g. metadata, format, SW plug-ins,…).

Do no significant harm (‘DNSH’)

(1) Climate change mitigation	To be determined
(2) Climate change adaptation	To be determined
(4) Transition to a circular economy	To be determined
(5) Pollution prevention and control	To be determined
(6) The protection and restoration of biodiversity and ecosystems	To be determined

Rationale

The use of earth observation data is a key enabler in the creation of metrics that are comparable and available worldwide.

The frequent launch of new satellites increases the number of available earth observation data. In addition, new generations of satellites come with more precise sensors and higher

resolutions. These technological advances will allow the scientific community to track the criteria in a more precise and granular manner. Indeed, as mentioned at the end of the document the information and data delivered have uncertainties linked to the observation and analysis. The spatial resolution of the satellite images will be key in the use of the indicators by the targeted actors.

6.6 Provision of data-driven solutions enabling to prolong asset's lifetime, provide value chain material and product information, or enable product designers to make a substantial contribution to the circular economy

Description of the activity

Development of ICT solutions that are aimed at collecting, transmitting, storing data and at its modelling and use where those activities are predominantly aimed at making a substantial contribution to the circular economy, as defined in article 13 of EU Regulation (EU) 2020/852, and where those technologies are not already explicitly covered in other activities substantially contributing to the transition to the circular economy.

ICT solutions include software and firmware, as well as sensors, instruments and systems needed for data collection.

The economic activities in this category could be associated with several NACE codes, in particular J61, J62 and J63.11 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

An economic activity in this category is an enabling activity in accordance with Article 13(1), point (l), of Regulation (EU) 2020/852 where it complies with the technical screening criteria set out in this Section.

Substantial contribution to transition to a circular economy

The ICT solutions are predominantly used for the provision of data and analytics enabling circular economy.

The following ICT solutions are targeted:

- Monitoring systems that enable to substantially prolong asset's lifetime, through preventive detection of wear and tear, default and damage of infrastructure and assets.
- Software, instruments and devices that provide identification, tracking and tracing of materials, products and assets through value chains in order to make accessible structured data to enable reverse logistics and value-retention activities, closed loop systems and more detailed and verifiable information to consumers on sustainability.
- Design tools and digital prototyping tools for products, systems and architectures, that enable to substantially improve the circular performance of the asset, through increased use of recycled materials, reduced use of critical raw materials, improved durability, repair, remanufacture capabilities, and end of life recyclability.

The activity makes a substantial contribution to the environmental objective by proving that the machinery is essential and material to achieve the substantial contribution criteria in another activity substantially contributing to the transition to the circular economy. In particular, the activity proves that:

- the use of this equipment always helps make a substantial contribution to the transition to the circular economy,
- the equipment directly helps fulfil the technical screening criteria of the enabled activity (i.e. another taxonomy aligned activity substantially contributing to the transition to the circular economy), which is the intended use of the machine

This assessment is publicly disclosed and 3rd party verified. The 3rd party assessment is publicly disclosed

Do no significant harm ('DNSH')

(1) Climate change mitigation	The manufactured equipment has a life cycle performance above average compared to technologies with a similar purpose currently available on the market. Environmental Impacts are calculated using Recommendation 2013/179/EU. Quantified life-cycle environmental impact reductions are verified by an independent third party which transparently assesses how the standard criteria, including those for critical review, have been followed when the value was derived. The 3rd party assessment is publicly disclosed

	The activity assesses the availability of and, where feasible, adopts techniques that support: - Energy efficiency of the equipment, - Minimization of embodied GHG emissions, For energy-related products, the use of decarbonized energy sources during the product's operation
(2) Climate change adaptation	DN DNSH as set out in [Appending A of Annex 1 to the Commission Delegated Regulation (EU) …/… supplementing Regulation (EU) 2020/852]
(3) Sustainable use and protection of water and marine resources	DNSH as set out in [Appending B of Annex 1 to the Commission Delegated Regulation (EU) …/… supplementing Regulation (EU) 2020/852]
(5) Pollution prevention and control	The equipment used meets the requirements set in accordance with Directive 2009/125/EC for servers and data storage products. The equipment used does not contain the restricted substances listed in Annex II to Directive 2011/65/EU, except where the concentration values by weight in homogeneous materials do not exceed those listed in that Annex. A waste management plan is in place and ensures maximal recycling at end of life of electrical and electronic equipment, including through contractual agreements with recycling partners, reflection in financial projections or official project documentation. At its end of life, the equipment undergoes preparation for reuse, recovery or recycling operations, or proper treatment, including the

	removal of all fluids and a selective treatment in accordance with Annex VII to Directive 2012/19/EU.
(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in [Appending D of Annex 1 to the Commission Delegated Regulation (EU) …/… supplementing Regulation (EU) 2020/852]

Rationale

This activity is based on Article 16 of Regulation (EU) 2020/852.

On the methodology, these criteria took as a starting point the European Commission Climate delegated act adopted on 4th June 2021, which also lists enabling activities. For instance, for the objective of climate change mitigation, the climate delegated act lists specific manufacturing activities which enable, in their nature, to make a substantial to the climate change mitigation objective (it is for instance the case of renewable energy equipment). It also contains a more 'open' activity whereby the substantial contribution has to be proven, showing substantial GHG emissions reduction using an LCA approach.

This activity lies somewhere in between: on the one hand, it refers to specific ICT solutions, with a specific purpose closely connected to the transition to the circular economy. On the other however, the solutions identified in this activity are not necessarily able to make a substantial contribution to the circular economy by nature, as it depends where these solutions are implemented. For instance, monitoring systems detecting failures may be used to detect other failures than those directly impacting on the product lifetime and durability. This is why additional requirements are proposed to ensure that the manufactured machinery enables the substantial contribution to be made.

The objective of this activity is to target the most obvious and widespread uses of ICT technologies in a circular economy, i.e. technologies contributing to map out and monitor products' functionality, effectiveness and efficiency in order to extend the product lifetime or

material and/or product passport technologies which are absolutely crucial to enable all actors along the value chain to be provided with the right information to retain or recover all useful components and materials.

Given that sometimes, the same equipment can be used in activities which do contribute to making a substantial contribution to the circular economy, and sometimes not, a case-by-case assessment of the activity operator proving that there is a direct and causal link between the equipment and the substantial contribution achieved in another activity.

Where economic activities have the potential to enable substantial circularity benefits in other sectors, these should also be included (assuming the life cycle performance of the activity do not undermine other environmental objectives).

The activity is broad and technology neutral in the sense that the technology simply must showing a direct and causal link with the enabled activity.

6.7 Provision of data-driven solutions enabling map and monitor water quality and scarcity, and manufacture of equipment enabling the efficient use and treatment of water resources

Description of the activity

Manufacture of technologies aimed at substantially enabling the sustainable use and protection of water and marine resources as defined in article 12 of EU Regulation (EU) 2020/852, where those technologies are not already explicitly covered in other activities substantially contributing to the sustainable use and protection of water and marine resources.

The economic activities in this category could be associated with several NACE codes, in particular from C22, C25, C26, C27, C28, J61, J62 and J63 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

An economic activity in this category is an enabling activity in accordance with Article 12(1), point (e), of Regulation (EU) 2020/852 where it complies with the technical screening criteria set out in this Section.

Substantial contribution to a sustainable use and protection of water and marine resources

The economic activity manufactures technologies that are aimed at and demonstrate sustainable use and protection of water and marine resources.

Technologies include equipment, systems, machines, components and software.

The economic activity manufactures one or more of the following technology:

- Water metering or monitoring systems, that enable to monitor, optimize, and substantially reduce water consumption (including systems reducing water pressure and peak water demand in the water distribution system) or substantially reduce leaks,
- Systems that measure the water quality, including the status of water bodies,
- Wastewater treatment technologies directly enabling to meet performance requirements of taxonomy aligned activities substantially contributing to the sustainable use and protection of water and marine resources,
- Rainwater collection systems and greywater reuse systems for alternative water resources, where these systems enable to substantially reduce the consumption of freshwater or enables protection against floods,
- Software, instruments and electric devices that enable water-quality-management to substantially increase the water-reusability and substantially reduce waste-water generation,
- Surveillance and mapping solutions to monitor the condition and protect marine resources, such as coral reefs and of fish resources,
- Remote sensing technology used to detect, map, and track marine pollution such as oil and chemical spills, algal blooms, and high suspended solid concentrations.

The activity makes a substantial contribution to the environmental objective by proving that the machinery is essential and material to achieve the substantial contribution criteria in another activity substantially contributing to the sustainable use and protection of water and marine resources. In particular, the activity proves that:

- the use of this equipment always helps make a substantial contribution to the sustainable use and protection of water and marine resources,
- the equipment directly helps fulfil the technical screening criteria of the enabled activity (i.e. another taxonomy aligned activity substantially contributing to the sustainable use and protection of water and marine resources), which is the intended use of the machine

This assessment is publicly disclosed and 3rd party verified. The 3rd party assessment is publicly disclosed

Do no significant harm ('DNSH')	
(1) Climate change mitigation	The activity assesses the availability of and, where feasible, adopts techniques that support: - Energy efficiency of the equipment, - Minimization of embodied GHG emissions, For energy-related products, the use of decarbonized energy sources during the product's operation. The manufactured equipment has a life cycle performance above average compared to technologies with a similar purpose currently available on the market. Environmental Impacts are calculated using Recommendation 2013/179/EU. Quantified life-cycle environmental impact reductions are verified by an independent third party which transparently assesses how the standard criteria, including those for critical review, have been followed when the value was derived. The 3rd party assessment is publicly disclosed.
(2) Climate change adaptation	DNSH as set out in [Appending A of Annex 1 to the Commission Delegated Regulation (EU) …/… supplementing Regulation (EU) 2020/852]
(4) Transition to a Circular Economy	The activity assesses the availability of and, where feasible, adopts techniques that support: (a)reuse and use of secondary raw materials and reused components in products manufactured;

	(b)design for high durability, recyclability, easy disassembly and adaptability of products manufactured; (c)waste management that prioritises recycling over disposal, in the manufacturing process; (d)information on and traceability of substances of concern throughout the life cycle of the manufactured products.
(5) Pollution prevention and control	DNSH as set out in [Appending C of Annex 1 to the Commission Delegated Regulation (EU) …/… supplementing Regulation (EU) 2020/852] In addition, the manufactured equipment has a life cycle performance above average compared to technologies with a similar purpose currently available on the market. Environmental Impacts are calculated using Recommendation 2013/179/EU. Quantified life-cycle environmental impact reductions are verified by an independent third party which transparently assesses how the standard criteria, including those for critical review, have been followed when the value was derived. The 3rd party assessment is publicly disclosed. No additional temperature emissions to water bodies i.e. where water is used as cooling medium.
(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in [Appending D of Annex 1 to the Commission Delegated Regulation (EU) …/… supplementing Regulation (EU) 2020/852]

Rationale

This activity is based on Article 16 of Regulation (EU) 2020/852.

On the methodology, these criteria took as a starting point the European Commission Climate delegated act adopted on 4th June 2021, which also lists enabling activities. For instance, for the objective of climate change mitigation, the climate delegated act lists specific manufacturing activities which enable, in their nature, to make a substantial to the climate change mitigation objective (it is for instance the case of renewable energy equipment). It also contains a more 'open' activity whereby the substantial contribution has to be proven, showing substantial GHG emissions reduction using an LCA approach.

This activity lies somewhere in between: on the one hand, it refers to specific machinery and data driven solutions, with a specific purpose closely connected to sustainable use of water and the protection of water and marine resources. On the other however, the solutions identified in this activity are not necessarily able to make a substantial contribution to this objective by nature, as it depends where these solutions are implemented. For instance, monitoring systems measuring water quality and/or quantity may be used for monitoring purposes only and do not necessarily translate into a substantial contribution to this environmental objective. This is why additional requirements are proposed.

This objective of this activity is to target the most obvious and widespread uses of machinery and data driven solutions for the preservation of water and marine resources, i.e. technologies contributing to map out and monitor water and marine resources, in order for instance to adjust water consumption, or machinery enabling highly efficient waste water treatment.

Given that sometimes, the same equipment can be used in activities which do contribute to making a substantial contribution to the water objective, and sometimes not, a case-by-case assessment of the activity operator proving that there is a direct and causal link between the equipment and the substantial contribution achieved in another activity.

Where economic activities have the potential to enable substantial water-related benefits in other sectors, these should also be included (assuming the life cycle performance of the activity do not undermine other environmental objectives).

The activity is on purpose broad and technology neutral in the sense that the technology simply must showing a direct and causal link with the enabled activity.

7. Disaster risk management

7.1 Emergency services – Emergency health services

Description of the activity

Emergency first aid and medical care of patients affected by a hazard emergency:

- Patient intake, screening and profiling (triage) on the site of the disaster or in a healthcare facility
- Provision of first aid
- Stabilisation and referral of severe trauma and non-trauma emergencies, if applicable, preparing the patient for transport to a health care facility for final treatment
- An advanced life support
- Anaesthesia, imaging, sterilisation, laboratory and blood transfusion services related to health emergency situations
- Performing damage control surgery, general emergency surgery
- Definite care for minor trauma and non-trauma emergencies.
- Medical evacuation of disaster victims, including ground, water transport and areal evacuation.
- Setting up field hospitals and providing initial and/or follow-up trauma and medical care in those hospitals, taking into account acknowledged international guidelines for foreign field hospital use, such as World Health Organisation or Red Cross guidelines.

The activity scope includes preparedness activities directly related to emergency health and may include but is not limited to: development and update of emergency response plans; construction and maintenance of training facilities used for training to respond to climate change-attributable hazards; training and capacity building of emergency health staff or volunteers; stockpiling and storage of materials and equipment necessary for responding to health emergencies; construction, purchasing, upgrading and maintenance of infrastructure and equipment necessary for responding to health emergencies; related educational and awareness-raising activities carried out by emergency health service providers in the community and/or targeted at selected stakeholders/target groups.

The scope excludes any of the above activities if they exclusively address health emergencies or health impacts during other types emergencies that cannot be attributed to current and future projected climatic factors.

The activity scope may include, but is not limited to NACE code(s):

86.10 Hospital activities

- short- or long-term hospital activities, i.e., medical, diagnostic and treatment activities, of general hospitals (e.g., community and regional hospitals, hospitals of non-profit organisations, university hospitals, military-base and prison hospitals) and specialised hospitals (e.g., mental health and substance abuse hospitals, hospitals for infectious diseases, maternity hospitals, specialised sanatoriums).

The activities are chiefly directed to inpatients, are carried out under the direct supervision of medical doctors and include:

(..)

- emergency room services

86.90 Other human health activities

- ambulance transport of patients by any mode of transport including airplanes. These services are often provided during a medical emergency

The following NACE code element is excluded from the activity scope:

84.22 Defence activities

This class includes:

- administration, supervision and operation of military defence affairs and land, sea, air and space defence forces

such as: (..) health activities for military personnel in the field

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Substantial contribution to climate change adaptation

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1. The economic activity has implemented physical and non-physical solutions ('adaptation solutions') that substantially reduce the most important physical climate risks that are material to that activity.

2.The physical climate risks that are material to the activity have been identified from those listed in Appendix A to Annex II of the Delegated Act[421] by performing a robust climate risk and vulnerability assessment with the following steps:

(a) screening of the activity to identify which physical climate risks from the list in Appendix A to Annex II of the Delegated Act may affect the performance of the economic activity during its expected lifetime;

(b) where the activity is assessed to be at risk from one or more of the physical climate risks listed in Appendix A to Annex II of the Delegated Act, a climate risk and vulnerability assessment to assess the materiality of the physical climate risks on the economic activity;

(c) an assessment of adaptation solutions that can reduce the identified physical climate risk.

The climate risk and vulnerability assessment is proportionate to the scale of the activity and its expected lifespan, such that:

(a) for activities with an expected lifespan of less than 10 years, the assessment is performed, at least by using climate projections at the smallest appropriate scale;

(b) for all other activities, the assessment is performed using the highest available resolution, state of-the-art climate projections across the existing range of future scenarios[422] consistent with the expected lifetime of the activity, including, at least, 10 to 30 years climate projections scenarios for major investments.

[421] COMMISSION DELEGATED REGULATION (EU) …/... supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council by establishing the technical screening criteria for determining the conditions under which an economic activity qualifies as contributing substantially to climate change mitigation or climate change adaptation and for determining whether that economic activity causes no significant harm to any of the other environmental objectives-C/2021/2800 final

[422] Future scenarios include Intergovernmental Panel on Climate Change representative concentration pathways RCP2.6, RCP4.5, RCP6.0 and RCP8.5.

3. The climate projections and assessment of impacts are based on best practice and available guidance and take into account the state-of-the-art science for vulnerability and risk analysis and related methodologies in line with the most recent Intergovernmental Panel on Climate Change reports[423], scientific peer-reviewed publications and open source[424] or paying models.

4.The adaptation solutions implemented:

(a) do not adversely affect the adaptation efforts or the level of resilience to physical climate risks of other people, of nature, of cultural heritage, of assets and of other economic activities;

(b) favour nature-based solutions[425] or rely on blue or green infrastructure[426] to the extent possible;

(c) are consistent with local, sectoral, regional or national adaptation plans and strategies;

(d) are monitored and measured against pre-defined indicators and remedial action is considered where those indicators are not met;

(e) where the solution implemented is physical and consists in an activity for which technical screening criteria have been specified in this Annex, the solution complies with the do no significant harm technical screening criteria for that activity.

5. In order for an activity to be considered as an enabling activity as referred to in Article 11(1), point (b), of Regulation (EU) 2020/852, the economic operator demonstrates, through an

[423] Assessments Reports on Climate Change: Impacts, Adaptation and Vulnerability, published periodically by the Intergovernmental Panel on Climate Change (IPCC), the United Nations body for assessing the science related to climate change produces, https://www.ipcc.ch/reports/.

[424] Such as Copernicus services managed by the European Commission.

[425] Nature-based solutions are defined as 'solutions that are inspired and supported by nature, which are cost-effective, simultaneously provide environmental, social and economic benefits and help build resilience. Such solutions bring more, and more diverse, nature and natural features and processes into cities, landscapes and seascapes, through locally adapted, resource-efficient and systemic interventions'. Therefore, nature-based solutions benefit biodiversity and support the delivery of a range of ecosystem services (version of [adoption date]: https://ec.europa.eu/info/research-and-innovation/research-area/environment/nature-based-solutions_en/).

[426] See Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Green Infrastructure (GI) — Enhancing Europe's Natural Capital (COM/2013/0249 final).

assessment of current and future climate risks, including uncertainty and based on robust data, , that the activity provides a technology, product, service, information, or practice, or promotes their uses with one of the following primary objectives: (a) increasing the level of resilience to physical climate risks of other people, of nature, of cultural heritage, of assets and of other economic activities; (b) contributing to adaptation efforts of other people, of nature, of cultural heritage, of assets and of other economic activities.

Do no significant harm (‘DNSH’)	
(1) Climate change mitigation	1.The operator of this activity has developed and implemented Climate Change Mitigation and Environmental Protection Plan following these steps: (a) Identification of key harmful climate and environmental impacts of their assets and operations, as a minimum including for climate change mitigation impacts in these categories: 1) Scope 1 GHG emissions (direct GHG emissions occurring from sources that are owned or controlled by the operator including GHG emissions of land, water and air emergency health transport) and 2) Scope 2 GHG emissions (GHG emissions from the generation of the electricity consumed by the operator); (b) Definition of the necessary measures to minimize the identified harmful impacts of the activity on climate and the environment in balance with the successful achievement of the main purpose of the emergency service. The plan is to explain the level of improvement achievable with the implementation of the proposed measures and include a time plan for the implementation of the full range of the identified measures; (c) Monitoring and documentation of the implementation of the identified measures in accordance with the time plan as well as

	monitoring and documentation of the level of improvements achieved. 2. The Climate Change Mitigation and Environmental Protection Plans: (a) Are based on best available scientific or equally rigorous other evidence, which is transparently reported; (b) To the extent applicable, employ the techniques included in the reference documents for the Best Available Techniques (BAT) – so-called BREF(s))[427] related to Article 13(1) of the Industrial Emissions Directive (IED, 2010/75/EU)[428] – or other techniques that demonstrably provide for an equivalent or higher level of environmental protection – to ensure emissions to air, water and soil are prevented / minimized; (c) Are developed in consultation with relevant stakeholders, including but not limited to environmental protection authorities; (d) Are updated if and when the characteristics and modus operandi of the activity change significantly, potentially altering the nature and/or scale of impacts on climate and the environment.
(3) Sustainable use and protection of water and marine resources	1.The operator of this activity has developed and implemented Climate Change Mitigation and Environmental Protection Plan following these steps: (a) Identification of key harmful climate and environmental impacts of their assets and operations, as a minimum for the objective of protecting water and marine resources including impacts in these categories:

[427] https://eippcb.jrc.ec.europa.eu/reference/

[428] https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1579186952334&uri=CELEX:32010L0075

	i) impacts on water and marine resources, including on the areas included in the Water Framework Directive registers of protected areas (Article 6, Directive 2000/60/EC or other equivalent national or international classifications/definitions); (b) Definition of the necessary measures to minimize the identified harmful impacts of the activity on climate and the environment in balance with the successful achievement of the main purpose of the emergency service. The plan is to explain the level of improvement achievable with the implementation of the proposed measures and include a time plan for the implementation of the full range of the identified measures; (c) Monitoring and documentation of the implementation of the identified measures in accordance with the time plan as well as monitoring and documentation of the level of improvements achieved. 2. The Climate Change Mitigation and Environmental Protection Plans: (a) Are based on best available scientific or equally rigorous other evidence, which is transparently reported; (b) To the extent applicable, employ the techniques included in the reference documents for the Best Available Techniques (BAT) – so-called BREF(s))[429] related to Article 13(1) of the Industrial Emissions Directive (IED, 2010/75/EU)[430] – or other techniques that demonstrably provide for an equivalent or higher level of environmental protection – to ensure emissions to air, water and soil are prevented / minimized;

[429] https://eippcb.jrc.ec.europa.eu/reference/

[430] https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1579186952334&uri=CELEX:32010L0075

	(c) Are developed in consultation with relevant stakeholders, including but not limited to environmental protection authorities; (d) Are updated if and when the characteristics and modus operandi of the activity change significantly, potentially altering the nature and/or scale of impacts on climate and the environment.
(4) Transition to a circular economy	1.The operator of this activity has developed and implemented Climate Change Mitigation and Environmental Protection Plan following these steps: (a) Identification of key harmful climate and environmental impacts of their assets and operations, as a minimum for transition to a circular economy objective including impacts in these categories: 1) waste (as defined in the Commission Decision 2000/532/EC list of waste) generation, management, treatment; and 2) alignment with circular economy principles (reduction of landfilling, increased reuse and recycling of products, materials and resources). 3) The negative impacts of frequent use of single-use products and improper waste management (both hazardous and non-hazardous). (b) Definition of the necessary measures to minimize the identified harmful impacts of the activity on climate and the environment in balance with the successful achievement of the main purpose of the emergency service. The plan is to explain the level of improvement achievable with the implementation of the proposed measures and include a time plan for the implementation of the full range of the identified measures; (c) Monitoring and documentation of the implementation of the identified measures in accordance with the time plan as well as monitoring and documentation of the level of improvements achieved.

	2. The Climate Change Mitigation and Environmental Protection Plans: (a) Are based on best available scientific or equally rigorous other evidence, which is transparently reported; (b) To the extent applicable, employ the techniques included in the reference documents for the Best Available Techniques (BAT) – so-called BREF(s))[431] related to Article 13(1) of the Industrial Emissions Directive (IED, 2010/75/EU)[432] – or other techniques that demonstrably provide for an equivalent or higher level of environmental protection – to ensure emissions to air, water and soil are prevented / minimized; (c) Are developed in consultation with relevant stakeholders, including but not limited to environmental protection authorities; (d) Are updated if and when the characteristics and modus operandi of the activity change significantly, potentially altering the nature and/or scale of impacts on climate and the environment.
(5) Pollution prevention and control	1.The operator of this activity has developed and implemented Climate Change Mitigation and Environmental Protection Plan following these steps: (a) Identification of key harmful climate and environmental impacts of their assets and operations, as a minimum for pollution prevention and control objective including impacts in these categories: 1) polluting emissions to air, water or land as defined in Article 3(3) Directive 2010/75/EU;

[431] https://eippcb.jrc.ec.europa.eu/reference/

[432] https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1579186952334&uri=CELEX:32010L0075

	(b) Definition of the necessary measures to minimize the identified harmful impacts of the activity on climate and the environment in balance with the successful achievement of the main purpose of the emergency service. The plan is to explain the level of improvement achievable with the implementation of the proposed measures and include a time plan for the implementation of the full range of the identified measures; (c) Monitoring and documentation of the implementation of the identified measures in accordance with the time plan as well as monitoring and documentation of the level of improvements achieved. 2. The Climate Change Mitigation and Environmental Protection Plans: (a) Are based on best available scientific or equally rigorous other evidence, which is transparently reported; (b) To the extent applicable, employ the techniques included in the reference documents for the Best Available Techniques (BAT) – so-called BREF(s))[433] related to Article 13(1) of the Industrial Emissions Directive (IED, 2010/75/EU)[434] – or other techniques that demonstrably provide for an equivalent or higher level of environmental protection – to ensure emissions to air, water and soil are prevented / minimized; (c) Are developed in consultation with relevant stakeholders, including but not limited to environmental protection authorities; (d) Are updated if and when the characteristics and modus operandi of the activity change significantly, potentially altering the nature and/or scale of impacts on climate and the environment.

[433] https://eippcb.jrc.ec.europa.eu/reference/

[434] https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1579186952334&uri=CELEX:32010L0075

(6) Protection and restoration of biodiversity and ecosystems	1.The operator of this activity has developed and implemented Climate Change Mitigation and Environmental Protection Plan following these steps: (a) Identification of key harmful climate and environmental impacts of their assets and operations, as a minimum for the protection and restoration of biodiversity and ecosystems objective including impacts in these categories: i) impacts on biodiversity and ecosystems, including on biodiversity-sensitive areas, such as Natura2000 areas (listed in the Natura 2000 Viewer) in accordance with the Habitats Directive (Article 3, Directive 92/43/EEC), Birds Directive (Article 4, Directive 2009/147/EC), and the Marine Strategy Framework Directive (Recital 6 and 7 and Article 21, Directive 2008/56/EC) (or other equivalent national or international classifications/definitions); (b) Definition of the necessary measures to minimize the identified harmful impacts of the activity on climate and the environment in balance with the successful achievement of the main purpose of the emergency service. The plan is to explain the level of improvement achievable with the implementation of the proposed measures and include a time plan for the implementation of the full range of the identified measures; (c) Monitoring and documentation of the implementation of the identified measures in accordance with the time plan as well as monitoring and documentation of the level of improvements achieved. 2. The Climate Change Mitigation and Environmental Protection Plans: (a) Are based on best available scientific or equally rigorous other evidence, which is transparently reported; (b) To the extent applicable, employ the techniques included in the reference documents for the Best Available Techniques (BAT) –

	so-called BREF(s))[435] related to Article 13(1) of the Industrial Emissions Directive (IED, 2010/75/EU)[436] – or other techniques that demonstrably provide for an equivalent or higher level of environmental protection – to ensure emissions to air, water and soil are prevented / minimized; (c) Are developed in consultation with relevant stakeholders, including but not limited to environmental protection authorities; (d) Are updated if and when the characteristics and modus operandi of the activity change significantly, potentially altering the nature and/or scale of impacts on climate and the environment.

Rationale

On scope

- The highest SC to adaptation would be delivered if all aspects of civil protection – prevention, preparedness, response and recovery - are included in the taxonomy, however that would require inclusion of a very high number of economic activities and would likely overlap with many other activities already included or are currently being developed. Taken that several prevention and preparedness related economic activities are being worked on separately, it is considered sensible for this activity to be focused on disaster/emergency response.
- "Disaster response" definition EU: "any action taken [..] in the event of an imminent disaster, or during or after a disaster, to address its immediate adverse consequences."[437]
- The activity scope is aligned with the classification of the EU Civil Protection Mechanism framework.

[435] https://eippcb.jrc.ec.europa.eu/reference/

[436] https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1579186952334&uri=CELEX:32010L0075

[437] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02013D1313-20210101

- However, where any of these activities also include prevention and preparedness related actions carried out by the same operator who provides the identified emergency response, those would also be included and accounted for in the scope of this activity – to avoid unnecessarily detailed compartmentalisation, meaning that the CapEx and OpEx and turnover related to these actions will be eligible to be reported as "taxonomy aligned".

- The system boundary is necessary for the definition of the scope of the activity and its sub-activities to clearly delineate between in-scope activities and the related up-stream (and down-stream) processes. The following rules apply for setting the system boundary of Emergency Services:

    - The proposed activity system boundary is the service itself – all actions that are carried out as integral parts of the specific emergency service. This excludes upstream processes, such as all manufacturing and sales of goods and materials and machinery used in the implementation of these services (however, the service of, for example, stockpiling such goods (e.g., pharmaceuticals) would be seen as pertaining to the Emergency Services themselves and therefore within scope of this activity. Likewise excluded are supporting services, which themselves cannot be defined as one of the Emergency Services (these should be seen as activities that enable Emergency Services), e.g., the ICT services for setting up early warning systems.

    - The actions and expenditure, which are clearly dedicated to emergency response that is not related (attributable) to current or future expected climate and do not contribute to emergency services activities in response to emergencies related to current or future climatic conditions, are excluded from this activity.

    - In terms of geographic boundaries this activity includes emergency services that are carried out outside of Europe but are carried out by European actors.[438]

[438] Note to reviewers: more work needs to be done on how the scenario when foreign operators carry out emergency response activities in Europe might affect adaptation taxonomy and its application.

- The activity description should precede the NACE code in importance for setting the activity scope and delimitations as there is no overall alignment with NACE classification for these activities.

On Substantial Contribution criteria

- Emergency health services as an economic activity are highly vulnerable to climate change impacts – that is, climate change impacts render emergency health services unable to fulfil their core purpose as they are not equipped to deal with the scale, nature and frequency of emergencies in the changed climatic conditions, UNLESS the activity is itself adapted with a high priority. The high priority is due to both a) high direct vulnerability b) domino effects and significant increase of overall impacts across a territory if the activity is not adapted.

- Well-adapted emergency health services increase the overall background resilience of an area and that leads to the overall background resilience of people and workforce in the economic activities carried out in the area. This can be interpreted as an “enabling” contribution, however the enabling impact is diffuse throughout the territory and is not “directly” targeted to enable specific identifiable other economic activities, the link in this case is indirect and diffuse and broader than just economic activities.

- Based on the two points above, the activity is to be included in the taxonomy as both high priority “adapted” and “enabling” activity.

- The SC criteria for adaptation for activities that need to be regarded as both adapted and enabling in TEG recommendations and in the 1st Delegated Act follow process-based approach, which is likewise deemed to be the most suitable for emergency health services activities.

- The resilience to climate change of Emergency Health Services is ensured by implementing adaptation solutions for identified climate change risks safeguarding the continued effective operation of Emergency Health Services activities in the current and future climatic conditions without serious preventable failures, including when responding to natural hazards and emergencies exacerbated by climate change impacts. The implemented measures ensure the ability of Emergency Health Services activities’ to contribute substantially to reducing or preventing the adverse impact of the current or expected future climate, or the risks of such adverse impact, on people,

cultural heritage, nature, assets and other economic activities within the EU and internationally."

On DNSH criteria

- The criteria for no significant harm to the climate and environmental objectives in the case of emergency services need to recognise and be balanced against the primary purposes of emergency services. It is seen to be outside of the remit of the Platform to make the best judgement on the appropriate balance between, on one hand - the goals of protecting and saving lives, health, assets and natural and cultural values- and on the other hand - the environmental protection and GHG emissions reductions. Nevertheless, for the emergency services activities to be recognised as Taxonomy aligned, environmental and climate considerations need to be integrated in emergency services planning, operations and coordination as part of DNSH approach.

- Due to the characteristics of immediacy and rapid decision-making during emergency response, the environmental and climate considerations need to be integrated starting from the early stages of emergency response planning, training of staff, defining response protocols as well as development of supporting systems and tools.

- Due to the considerations above, a self-assessment of climate and environmental impacts and early coordinated mitigating action planning and implementation involving environmental protection authorities and stakeholders via process based DNSH criteria is considered the most appropriate approach. Therefore, the criteria are designed around a requirement to develop a Climate Mitigation and Environmental Protection plans following a set of steps and covering all relevant mitigation and environmental impacts.

- To ensure that the required impact identification and action planning by emergency services operators addresses all other taxonomy objectives as relevant to the activity and has sufficient scope, the minimum key impact areas to be considered is listed.

- Further important requirements are the analysis and transparent reporting on the level of improvement achievable by the planned actions, setting up of monitoring framework and reporting on action implementation and improvements achieved, and minimum quality and governance requirements.

To ensure that specific potentially significant environmental impacts as identified per emergency service activity are included in the mandated plans, specific per-activity scope requirements are included.

7.2 Emergency services – Disaster response coordination

Description of the activity

The establishment and operation of assessment, coordination and/or preparedness facilities and team(s) as permanent emergency response coordination centres or on-site operations coordination centres in the location of an emergency.

The operation of emergency response includes, but may not be limited to, command, assessment/analysis, planning, liaison/coordination, communication, media reporting.

The activity scope includes preparedness activities directly related to emergency response coordination and may include but is not limited to: development and update of emergency response coordination plans; training and capacity building of emergency response coordination staff, or volunteers; stockpiling and storage of materials and equipment necessary for emergency response coordination; construction, purchasing, upgrading and maintenance of infrastructure and equipment necessary for emergency response coordination; related educational and awareness-raising activities carried out by the emergency response coordination providers in the community and/or targeted at selected stakeholders/target groups.

The scope excludes any of the above activities if they exclusively address emergency response coordination in relation to emergencies that cannot be attributed to current and future projected climatic factors.

No NACE codes directly associated with this activity

Substantial contribution to climate change adaptation

1. The economic activity has implemented physical and non-physical solutions ('adaptation solutions') that substantially reduce the most important physical climate risks that are material to that activity.

2.The physical climate risks that are material to the activity have been identified from those listed in Appendix A to Annex II of the Delegated Act[439] by performing a robust climate risk and vulnerability assessment with the following steps:

(a) screening of the activity to identify which physical climate risks from the list in Appendix A to Annex II of the Delegated Act may affect the performance of the economic activity during its expected lifetime;

(b) where the activity is assessed to be at risk from one or more of the physical climate risks listed in Appendix A to Annex II of the Delegated Act, a climate risk and vulnerability assessment to assess the materiality of the physical climate risks on the economic activity;

(c) an assessment of adaptation solutions that can reduce the identified physical climate risk.

The climate risk and vulnerability assessment is proportionate to the scale of the activity and its expected lifespan, such that:

(a) for activities with an expected lifespan of less than 10 years, the assessment is performed, at least by using climate projections at the smallest appropriate scale;

(b) for all other activities, the assessment is performed using the highest available resolution, state of-the-art climate projections across the existing range of future scenarios[440] consistent with the expected lifetime of the activity, including, at least, 10 to 30 years climate projections scenarios for major investments.

[439] COMMISSION DELEGATED REGULATION (EU) …/... supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council by establishing the technical screening criteria for determining the conditions under which an economic activity qualifies as contributing substantially to climate change mitigation or climate change adaptation and for determining whether that economic activity causes no significant harm to any of the other environmental objectives-C/2021/2800 final

[440] Future scenarios include Intergovernmental Panel on Climate Change representative concentration pathways RCP2.6, RCP4.5, RCP6.0 and RCP8.5.

3. The climate projections and assessment of impacts are based on best practice and available guidance andtake into account the state-of-the-art science for vulnerability and risk analysis and related methodologies in line with the most recent Intergovernmental Panel on Climate Change reports[441], scientific peer-reviewed publications and open source[442] or paying models.

4.The adaptation solutions implemented:

(a) do not adversely affect the adaptation efforts or the level of resilience to physical climate risks of other people, of nature, of cultural heritage, of assets and of other economic activities;

(b) favour nature-based solutions[443] or rely on blue or green infrastructure[444] to the extent possible;

(c) are consistent with local, sectoral, regional or national adaptation plans and strategies;

(d) are monitored and measured against pre-defined indicators and remedial action is considered where those indicators are not met;

(e) where the solution implemented is physical and consists in an activity for which technical screening criteria have been specified in this Annex, the solution complies with the do no significant harm technical screening criteria for that activity.

5. In order for an activity to be considered as an enabling activity as referred to in Article 11(1), point (b), of Regulation (EU) 2020/852, the economic operator demonstrates, through an assessment of current and future climate risks, including uncertainty and based on robust data,

[441] Assessments Reports on Climate Change: Impacts, Adaptation and Vulnerability, published periodically by the Intergovernmental Panel on Climate Change (IPCC), the United Nations body for assessing the science related to climate change produces, https://www.ipcc.ch/reports/.

[442] Such as Copernicus services managed by the European Commission.

[443] Nature-based solutions are defined as 'solutions that are inspired and supported by nature, which are cost-effective, simultaneously provide environmental, social and economic benefits and help build resilience. Such solutions bring more, and more diverse, nature and natural features and processes into cities, landscapes and seascapes, through locally adapted, resource-efficient and systemic interventions'. Therefore, nature-based solutions benefit biodiversity and support the delivery of a range of ecosystem services (version of [adoption date]: https://ec.europa.eu/info/research-and-innovation/research-area/environment/nature-based-solutions_en/).

[444] See Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Green Infrastructure (GI) — Enhancing Europe's Natural Capital (COM/2013/0249 final).

, that the activity provides a technology, product, service, information, or practice, or promotes their uses with one of the following primary objectives:

(a) increasing the level of resilience to physical climate risks of other people, of nature, of cultural heritage, of assets and of other economic activities;

(b) contributing to adaptation efforts of other people, of nature, of cultural heritage, of assets and of other economic activities.

Do no significant harm ('DNSH')

(1) Climate change mitigation	1.The operator of this activity has developed and implemented Climate Change Mitigation and Environmental Protection Plan following these steps: (a) Identification of key harmful climate and environmental impacts of their assets and operations, as a minimum for climate change mitigation including impacts in these categories: i) Scope 1 GHG emissions (direct GHG emissions occurring from sources that are owned or controlled by the operator) and ii) Scope 2 GHG emissions (GHG emissions from the generation of the electricity consumed by the operator); (d) Definition of the necessary measures to minimize the identified harmful impacts of the activity on climate and the environment in balance with the successful achievement of the main purpose of the emergency service. The plan is to explain the level of improvement achievable with the implementation of the proposed measures and include a time plan for the implementation of the full range of the identified measures; (e) Monitoring and documentation of the implementation of the identified measures in accordance with the time plan as well as monitoring and documentation of the level of improvements achieved.

	2. The Climate Change Mitigation and Environmental Protection Plans: (e) Are based on best available scientific or equally rigorous other evidence, which is transparently reported; (f) To the extent applicable, employ the techniques included in the reference documents for the Best Available Techniques (BAT) – so-called BREF(s))[445] related to Article 13(1) of the Industrial Emissions Directive (IED, 2010/75/EU)[446] – or other techniques that demonstrably provide for an equivalent or higher level of environmental protection – to ensure emissions to air, water and soil are prevented / minimized; (g) Are developed in consultation with relevant stakeholders, including but not limited to environmental protection authorities; Are updated if and when the characteristics and modus operandi of the activity change significantly, potentially altering the nature and/or scale of impacts on climate and the environment.
(3) Sustainable use and protection of water and marine resources	1.The operator of this activity has developed and implemented Climate Change Mitigation and Environmental Protection Plan following these steps: (a) Identification of key harmful climate and environmental impacts of their assets and operations, as a minimum for the objective of protecting water and marine resources including impacts in these categories: i) impacts on water and marine resources, including on the areas included in the Water Framework Directive registers of protected

[445] https://eippcb.jrc.ec.europa.eu/reference/

[446] https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1579186952334&uri=CELEX:32010L0075

areas (Article 6, Directive 2000/60/EC or other equivalent national or international classifications/definitions);

(b) Definition of the necessary measures to minimize the identified harmful impacts of the activity on climate and the environment in balance with the successful achievement of the main purpose of the emergency service. The plan is to explain the level of improvement achievable with the implementation of the proposed measures and include a time plan for the implementation of the full range of the identified measures;

(c) Monitoring and documentation of the implementation of the identified measures in accordance with the time plan as well as monitoring and documentation of the level of improvements achieved.

2. The Climate Change Mitigation and Environmental Protection Plans:

(a) Are based on best available scientific or equally rigorous other evidence, which is transparently reported;

(b) To the extent applicable, employ the techniques included in the reference documents for the Best Available Techniques (BAT) – so-called BREF(s))[447] related to Article 13(1) of the Industrial Emissions Directive (IED, 2010/75/EU)[448] – or other techniques that demonstrably provide for an equivalent or higher level of environmental protection – to ensure emissions to air, water and soil are prevented / minimized;

(c) Are developed in consultation with relevant stakeholders, including but not limited to environmental protection authorities;

[447] https://eippcb.jrc.ec.europa.eu/reference/

[448] https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1579186952334&uri=CELEX:32010L0075

	(d) Are updated if and when the characteristics and modus operandi of the activity change significantly, potentially altering the nature and/or scale of impacts on climate and the environment.
(4) Transition to a circular economy	1.The operator of this activity has developed and implemented Climate Change Mitigation and Environmental Protection Plan following these steps: (a) Identification of key harmful climate and environmental impacts of their assets and operations, as a minimum for transition to a circular economy objective including impacts in these categories: i) waste (as defined in the Commission Decision 2000/532/EC list of waste) generation, management, treatment; and ii) alignment with circular economy principles (reduction of landfilling, increased reuse and recycling of products, materials and resources). (b) Definition of the necessary measures to minimize the identified harmful impacts of the activity on climate and the environment in balance with the successful achievement of the main purpose of the emergency service. The plan is to explain the level of improvement achievable with the implementation of the proposed measures and include a time plan for the implementation of the full range of the identified measures; (c) Monitoring and documentation of the implementation of the identified measures in accordance with the time plan as well as monitoring and documentation of the level of improvements achieved. 2. The Climate Change Mitigation and Environmental Protection Plans: (a) Are based on best available scientific or equally rigorous other evidence, which is transparently reported;

	(b) To the extent applicable, employ the techniques included in the reference documents for the Best Available Techniques (BAT) – so-called BREF(s))[449] related to Article 13(1) of the Industrial Emissions Directive (IED, 2010/75/EU)[450] – or other techniques that demonstrably provide for an equivalent or higher level of environmental protection – to ensure emissions to air, water and soil are prevented / minimized; (c) Are developed in consultation with relevant stakeholders, including but not limited to environmental protection authorities; (d) Are updated if and when the characteristics and modus operandi of the activity change significantly, potentially altering the nature and/or scale of impacts on climate and the environment.
(5) Pollution prevention and control	1.The operator of this activity has developed and implemented Climate Change Mitigation and Environmental Protection Plan following these steps: (a) Identification of key harmful climate and environmental impacts of their assets and operations, as a minimum for pollution prevention and control objective including impacts in these categories: i) polluting emissions to air, water or land as defined in Article 3(3) Directive 2010/75/EU; (b) Definition of the necessary measures to minimize the identified harmful impacts of the activity on climate and the environment in balance with the successful achievement of the main purpose of the emergency service. The plan is to explain the level of

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biodiversity and ecosystems	(d) Identification of key harmful climate and environmental impacts of their assets and operations, as a minimum for the protection and restoration of biodiversity and ecosystems objective including impacts in these categories: i) impacts on biodiversity and ecosystems, including on biodiversity-sensitive areas, such as Natura2000 areas (listed in the Natura 2000 Viewer) in accordance with the Habitats Directive (Article 3, Directive 92/43/EEC), Birds Directive (Article 4, Directive 2009/147/EC), and the Marine Strategy Framework Directive (Recital 6 and 7 and Article 21, Directive 2008/56/EC) (or other equivalent national or international classifications/definitions); (e) Definition of the necessary measures to minimize the identified harmful impacts of the activity on climate and the environment in balance with the successful achievement of the main purpose of the emergency service. The plan is to explain the level of improvement achievable with the implementation of the proposed measures and include a time plan for the implementation of the full range of the identified measures; (f) Monitoring and documentation of the implementation of the identified measures in accordance with the time plan as well as monitoring and documentation of the level of improvements achieved. 2. The Climate Change Mitigation and Environmental Protection Plans: (e) Are based on best available scientific or equally rigorous other evidence, which is transparently reported; (f) To the extent applicable, employ the techniques included in the reference documents for the Best Available Techniques (BAT) –

	so-called BREF(s))[453] related to Article 13(1) of the Industrial Emissions Directive (IED, 2010/75/EU)[454] – or other techniques that demonstrably provide for an equivalent or higher level of environmental protection – to ensure emissions to air, water and soil are prevented / minimized; (g) Are developed in consultation with relevant stakeholders, including but not limited to environmental protection authorities; (h) Are updated if and when the characteristics and modus operandi of the activity change significantly, potentially altering the nature and/or scale of impacts on climate and the environment.

Rationale

On scope

- The highest SC to adaptation would be delivered if all aspects of civil protection – prevention, preparedness, response and recovery - are included in the taxonomy, however that would require inclusion of a very high number of economic activities and would likely overlap with many other activities already included or are currently being developed. Taken that several prevention and preparedness related economic activities are being worked on separately, it is considered sensible for this activity to be focused on disaster/emergency response.
- "Disaster response" definition EU: "any action taken [..] in the event of an imminent disaster, or during or after a disaster, to address its immediate adverse consequences."[455]

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- The activity scope is aligned with the classification of the EU Civil Protection Mechanism framework.

- Where this activity also includes prevention and preparedness related actions carried out by the same operator who provides the identified emergency response, those would also be included and accounted for in the scope of this activity – to avoid unnecessarily detailed compartmentalisation, meaning that the CapEx and OpEx and turnover related to these actions will be eligible to be reported as “taxonomy aligned”.

- The system boundary is necessary for the definition of the scope of the activity and its sub-activities to clearly delineate between in-scope activities and the related up-stream (and down-stream) processes. The following rules apply for setting the system boundary of Emergency Services:

    - The proposed activity system boundary is the service itself – all actions that are carried out as integral parts of the specific emergency service. This excludes upstream processes, such as all manufacturing and sales of goods and materials and machinery used in the implementation of these services (however, the service of, for example, stockpiling such goods (e.g., pharmaceuticals) would be seen as pertaining to the Emergency Services themselves and therefore within scope of this activity. Likewise excluded are supporting services, which themselves cannot be defined as one of the Emergency Services (these should be seen as activities that enable Emergency Services), e.g., the ICT services for setting up early warning systems.

    - The actions and expenditure, which are clearly dedicated to emergency response that is not related (attributable) to current or future expected climate and do not contribute to emergency services activities in response to emergencies related to current or future climatic conditions, are excluded from this activity.

    - In terms of geographic boundaries this activity includes emergency services that are carried out outside of Europe but are carried out by European actors.[456]

[456] Note to reviewers: more work needs to be done on how the scenario when foreign operators carry out emergency response activities in Europe might affect adaptation taxonomy and its application.

- Longer running services such as disaster relief and temporary housing camps, which are established after climate-related natural catastrophe or crisis and fall under the scope of disaster relief are also included in this activity.

On Substantial Contribution criteria

- Emergency services for disaster response coordination as an economic activity are highly vulnerable to climate change impacts – that is, climate change impacts render emergency services for disaster response coordination unable to fulfil their core purpose as they are not equipped to deal with the scale, nature and frequency of emergencies in the changed climatic conditions, UNLESS the activity is itself adapted with a high priority. The high priority is due to both a) high direct vulnerability b) domino effects and significant increase of overall impacts across a territory if the activity is not adapted.

- Well-adapted emergency services for disaster response coordination increase the overall background resilience of an area and that leads to the overall background resilience of most economic activities carried out in the area. This can be interpreted as an “enabling” contribution, however the enabling impact is diffuse throughout the territory and is not “directly” targeted to enable specific identifiable other economic activities, the link in this case is indirect and diffuse.

- Based on the two points above, the activity is to be included in the taxonomy as both high priority “adapted” and “enabling” activity.

- The SC criteria for adaptation for activities that need to be regarded as both adapted and enabling in TEG recommendations and in the 1st Delegated Act follow process-based approach, which is likewise deemed to be the most suitable for emergency services for disaster response coordination The resilience to climate change of Emergency Services for disaster response coordination is ensured by implementing adaptation solutions for identified climate change risks safeguarding the continued effective operation of Emergency Services for disaster response coordination activities in the current and future climatic conditions without serious preventable failures, including when responding to natural hazards and emergencies exacerbated by climate change impacts. The implemented measures ensure the ability of Emergency Services for disaster response coordination activities to contribute substantially to reducing or preventing the adverse impact of the current or expected future climate, or the risks of

such adverse impact, on people, cultural heritage, nature, assets and other economic activities within the EU and internationally.

On DNSH criteria

- The criteria for no significant harm to the climate and environmental objectives in the case of emergency services need to recognise and be balanced against the primary purposes of emergency services. It is seen to be outside of the remit of the Platform to make the best judgement on the appropriate balance between, on one hand - the goals of protecting and saving lives, health, assets and natural and cultural values- and on the other hand - the environmental protection and GHG emissions reductions. Nevertheless, for the emergency services activities to be recognised as Taxonomy aligned, environmental and climate considerations need to be integrated in emergency services planning, operations and coordination as part of DNSH approach.

- Due to the characteristics of immediacy and rapid decision-making during emergency response, the environmental and climate considerations need to be integrated starting from the early stages of emergency response planning, training of staff, defining response protocols as well as development of supporting systems and tools.

- Due to the considerations above, a self-assessment of climate and environmental impacts and early coordinated mitigating action planning and implementation involving environmental protection authorities and stakeholders via process based DNSH criteria is considered the most appropriate approach. Therefore, the criteria are designed around a requirement to develop a Climate Mitigation and Environmental Protection plans following a set of steps and covering all relevant mitigation and environmental impacts.

- To ensure that the required impact identification and action planning by emergency services operators addresses all other taxonomy objectives as relevant to the activity and has sufficient scope, the minimum key impact areas to be considered are listed.

- Further important requirements are the analysis and transparent reporting on the level of improvement achievable by the planned actions, setting up of monitoring framework and reporting on action implementation and improvements achieved, and minimum quality and governance requirements.

- To ensure that specific potentially significant environmental impacts as identified per emergency service activity are included in the mandated plans, specific per-activity scope requirements are included

7.3 Emergency services – Disaster relief

Description of the activity

Ad hoc on location post-disaster relief activities, such as setting up and managing evacuation centres and similar and supplies of first necessities (such as medicine, food, water, warm clothing, blankets to those affected by the disaster) during and immediately after the disaster event. Setting up and operating emergency temporary camps providing emergency temporary shelter in coordination with existing structures, local authorities and international organisations until handover to local authorities or humanitarian organisations. Where a handover takes place, the activity includes training the relevant personnel before it.

The activity scope includes preparedness activities directly related to disaster relief and may include but is not limited to: development and update of disaster relief plans; training and capacity building disaster relief staff, service animals or volunteers; preparatory designation and ensuring the readiness of make-shift disaster relief centres (such as community evacuation centres, water, food and aid dispensing locations and similar), stockpiling and storage of materials and equipment necessary for disaster relief operations; construction, purchasing, upgrading and maintenance of infrastructure and equipment necessary for disaster relief operations; related educational and awareness-raising activities carried out by the disaster relief providers in the community and/or targeted at selected stakeholders/target groups.

The scope excludes any of the above activities if they exclusively address disaster relief in relation to emergencies that cannot be attributed to current and future projected climatic factors.

The activity scope may include, but is not limited to NACE code(s):

88.99 - Other social work activities without accommodation n.e.c.

- social, counselling, welfare, refugee, referral and similar services which are delivered to individuals and families in their homes or elsewhere and carried out by government offices or by private organisations, disaster relief organisations and national or local self-help organisations and by specialists providing counselling services: welfare and guidance activities for children and adolescents.

- Activities for disaster victims, refugees, immigrants etc., including temporary or extended shelter for them.

Substantial contribution to climate change adaptation

1. The economic activity has implemented physical and non-physical solutions ('adaptation solutions') that substantially reduce the most important physical climate risks that are material to that activity.

2.The physical climate risks that are material to the activity have been identified from those listed in Appendix A to Annex II of the Delegated Act[457] by performing a robust climate risk and vulnerability assessment with the following steps:

(a) screening of the activity to identify which physical climate risks from the list in Appendix A to Annex II of the Delegated Act may affect the performance of the economic activity during its expected lifetime;

(b) where the activity is assessed to be at risk from one or more of the physical climate risks listed in Appendix A to Annex II of the Delegated Act, a climate risk and vulnerability assessment to assess the materiality of the physical climate risks on the economic activity;

(c) an assessment of adaptation solutions that can reduce the identified physical climate risk.

[457] COMMISSION DELEGATED REGULATION (EU) …/... supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council by establishing the technical screening criteria for determining the conditions under which an economic activity qualifies as contributing substantially to climate change mitigation or climate change adaptation and for determining whether that economic activity causes no significant harm to any of the other environmental objectives-C/2021/2800 final

The climate risk and vulnerability assessment is proportionate to the scale of the activity and its expected lifespan, such that:

(a) for activities with an expected lifespan of less than 10 years, the assessment is performed, at least by using climate projections at the smallest appropriate scale;

(b) for all other activities, the assessment is performed using the highest available resolution, state of-the-art climate projections across the existing range of future scenarios[458] consistent with the expected lifetime of the activity, including, at least, 10 to 30 years climate projections scenarios for major investments.

3. The climate projections and assessment of impacts are based on best practice and available guidance andtake into account the state-of-the-art science for vulnerability and risk analysis and related methodologies in line with the most recent Intergovernmental Panel on Climate Change reports[459], scientific peer-reviewed publications and open source[460] or paying models.

4.The adaptation solutions implemented:

(a) do not adversely affect the adaptation efforts or the level of resilience to physical climate risks of other people, of nature, of cultural heritage, of assets and of other economic activities;

[458] Future scenarios include Intergovernmental Panel on Climate Change representative concentration pathways RCP2.6, RCP4.5, RCP6.0 and RCP8.5.

[459] Assessments Reports on Climate Change: Impacts, Adaptation and Vulnerability, published periodically by the Intergovernmental Panel on Climate Change (IPCC), the United Nations body for assessing the science related to climate change produces, https://www.ipcc.ch/reports/.

[460] Such as Copernicus services managed by the European Commission.

(b) favour nature-based solutions[461] or rely on blue or green infrastructure[462] to the extent possible;

(c) are consistent with local, sectoral, regional or national adaptation plans and strategies;

(d) are monitored and measured against pre-defined indicators and remedial action is considered where those indicators are not met;

(e) where the solution implemented is physical and consists in an activity for which technical screening criteria have been specified in this Annex, the solution complies with the do no significant harm technical screening criteria for that activity.

5. In order for an activity to be considered as an enabling activity as referred to in Article 11(1), point (b), of Regulation (EU) 2020/852, the economic operator demonstrates, through an assessment of current and future climate risks, including uncertainty and based on robust data, , that the activity provides a technology, product, service, information, or practice, or promotes their uses with one of the following primary objectives:

(a) increasing the level of resilience to physical climate risks of other people, of nature, of cultural heritage, of assets and of other economic activities;

(b) contributing to adaptation efforts of other people, of nature, of cultural heritage, of assets and of other economic activities.

Do no significant harm ('DNSH')

[461] Nature-based solutions are defined as 'solutions that are inspired and supported by nature, which are cost-effective, simultaneously provide environmental, social and economic benefits and help build resilience. Such solutions bring more, and more diverse, nature and natural features and processes into cities, landscapes and seascapes, through locally adapted, resource-efficient and systemic interventions'. Therefore, nature-based solutions benefit biodiversity and support the delivery of a range of ecosystem services (version of [adoption date]: https://ec.europa.eu/info/research-and-innovation/research-area/environment/nature-based-solutions_en/).

[462] See Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Green Infrastructure (GI) — Enhancing Europe's Natural Capital (COM/2013/0249 final).

(1) Climate change mitigation	1.The operator of this activity has developed and implemented Climate Change Mitigation and Environmental Protection Plan following these steps: a) Identification of key harmful climate and environmental impacts of their assets and operations, as a minimum for climate change mitigation objective including impacts in these categories: i) Scope 1 GHG emissions (direct GHG emissions occurring from sources that are owned or controlled by the operator), including The GHG emissions of land, water and air transport and equipment used for disaster relief operations and ii) Scope 2 GHG emissions (GHG emissions from the generation of the electricity consumed by the operator); b) Definition of the necessary measures to minimize the identified harmful impacts of the activity on climate and the environment in balance with the successful achievement of the main purpose of the emergency service. The plan is to explain the level of improvement achievable with the implementation of the proposed measures and include a time plan for the implementation of the full range of the identified measures; c) Monitoring and documentation of the implementation of the identified measures in accordance with the time plan as well as monitoring and documentation of the level of improvements achieved. 2. The Climate Change Mitigation and Environmental Protection Plans: (a) Are based on best available scientific or equally rigorous other evidence, which is transparently reported; (b) To the extent applicable, employ the techniques included in the reference documents for the Best Available Techniques (BAT) –

	so-called BREF(s))[463] related to Article 13(1) of the Industrial Emissions Directive (IED, 2010/75/EU)[464] – or other techniques that demonstrably provide for an equivalent or higher level of environmental protection – to ensure emissions to air, water and soil are prevented / minimized; (c) Are developed in consultation with relevant stakeholders, including but not limited to environmental protection authorities; (d) Are updated if and when the characteristics and modus operandi of the activity change significantly, potentially altering the nature and/or scale of impacts on climate and the environment
(3) Sustainable use and protection of water and marine resources	1.The operator of this activity has developed and implemented Climate Change Mitigation and Environmental Protection Plan following these steps: (a) Identification of key harmful climate and environmental impacts of their assets and operations, as a minimum for the sustainable use of water and marine resources objective including impacts in these categories: i) impacts on water and marine resources, including on the areas included in the Water Framework Directive registers of protected areas (Article 6, Directive 2000/60/EC or other equivalent national or international classifications/definitions); (b) Definition of the necessary measures to minimize the identified harmful impacts of the activity on climate and the environment in balance with the successful achievement of the main purpose of the emergency service. The plan is to explain the level of improvement achievable with the implementation of the

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	(a) Identification of key harmful climate and environmental impacts of their assets and operations, as a minimum for the transition to circular economy objective including impacts in these categories: i) waste (as defined in the Commission Decision 2000/532/EC list of waste) generation, management, treatment, including the negative impacts of high use of single-use products and improper waste management; and ii) alignment with circular economy principles (reduction of landfilling, increased reuse and recycling of products, materials and resources). (b) Definition of the necessary measures to minimize the identified harmful impacts of the activity on climate and the environment in balance with the successful achievement of the main purpose of the emergency service, including planned actions for improved waste management, reduction of waste volume and positive contribution to circular economy. The plan is to explain the level of improvement achievable with the implementation of the proposed measures and include a time plan for the implementation of the full range of the identified measures; (c) Monitoring and documentation of the implementation of the identified measures in accordance with the time plan as well as monitoring and documentation of the level of improvements achieved. 2. The Climate Change Mitigation and Environmental Protection Plans: (a) Are based on best available scientific or equally rigorous other evidence, which is transparently reported; (b) To the extent applicable, employ the techniques included in the reference documents for the Best Available Techniques (BAT) –

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(a) Identification of key harmful climate and environmental impacts of their assets and operations, as a minimum for the protection and restoration of biodiversity and ecosystems objective including impacts in these categories:

i) impacts on biodiversity and ecosystems, including on biodiversity-sensitive areas, such as Natura2000 areas (listed in the Natura 2000 Viewer) in accordance with the Habitats Directive (Article 3, Directive 92/43/EEC), Birds Directive (Article 4, Directive 2009/147/EC), and the Marine Strategy Framework Directive (Recital 6 and 7 and Article 21, Directive 2008/56/EC) (or other equivalent national or international classifications/definitions), including the impacts arising due to the establishment and operation of disaster relief camps;

(b) Definition of the necessary measures to minimize the identified harmful impacts of the activity on climate and the environment in balance with the successful achievement of the main purpose of the emergency service. The plan is to explain the level of improvement achievable with the implementation of the proposed measures and include a time plan for the implementation of the full range of the identified measures;

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Rationale

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- "Disaster response" definition EU: "any action taken [..] in the event of an imminent disaster, or during or after a disaster, to address its immediate adverse consequences."[473]
- The activity scope is aligned with the classification of the EU Civil Protection Mechanism framework.

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    - The proposed activity system boundary is the service itself – all actions that are carried out as integral parts of the specific emergency service. This excludes upstream processes, such as all manufacturing and sales of goods and materials and machinery used in the implementation of these services (however, the service of, for example, stockpiling such goods would be seen as pertaining to the Emergency Services themselves and therefore within scope of this activity. Likewise excluded are supporting services, which themselves cannot be defined as one of the Emergency Services (these should be seen as activities that enable Emergency Services), e.g., the ICT services for setting up early warning systems.
    - The actions and expenditure, which are clearly dedicated to emergency response that is not related (attributable) to current or future expected climate and do not contribute to emergency services activities in response to emergencies related to current or future climatic conditions, are excluded from this activity.
    - In terms of geographic boundaries this activity includes emergency services that are carried out outside of Europe but are carried out by European actors.[474]
    - Longer running services for disaster relief such as temporary housing camps, which are established after climate-related natural catastrophe or crisis and fall under the scope of disaster relief are also included in this activity.

[474] Note to reviewers: more work needs to be done on how the scenario when foreign operators carry out emergency response activities in Europe might affect adaptation taxonomy and its application.

- The activity description should precede the NACE code in importance for setting the activity scope and delimitations as there is no overall alignment with NACE classification for these activities.

On Substantial Contribution criteria

- Emergency services for disaster relief as an economic activity are highly vulnerable to climate change impacts – that is, climate change impacts render emergency services for disaster relief unable to fulfil their core purpose as they are not equipped to deal with the scale, nature and frequency of emergencies in the changed climatic conditions, UNLESS the activity is itself adapted with a high priority. The high priority is due to both a) high direct vulnerability b) domino effects and significant increase of overall impacts across a territory if the activity is not adapted.
- Well-adapted emergency services for disaster relief increase the overall background resilience of an area and that leads to the overall background resilience of people and most economic activities carried out in the area. This can be interpreted as an “enabling” contribution, however the enabling impact is diffuse throughout the territory and is not “directly” targeted to enable specific identifiable other economic activities, the link in this case is indirect and diffuse.
- Based on the two points above, the activity is to be included in the taxonomy as both high priority “adapted” and “enabling” activity.
- The SC criteria for adaptation for activities that need to be regarded as both adapted and enabling in TEG recommendations and in the 1st Delegated Act follow process-based approach, which is likewise deemed to be the most suitable for emergency services for disaster relief .
- The resilience to climate change of Emergency Services for disaster relief is ensured by implementing adaptation solutions for identified climate change risks safeguarding the continued effective operation of Emergency Services for disaster relief activities in the current and future climatic conditions without serious preventable failures, including when responding to natural hazards and emergencies exacerbated by climate change impacts. The implemented measures ensure the ability of Emergency Services for disaster relief activities’ to contribute substantially to reducing or preventing the adverse impact of the current or expected future climate, or the risks of such adverse impact, on

people, cultural heritage, nature, assets and other economic activities within the EU and internationally.

On DNSH criteria

- The criteria for no significant harm to the climate and environmental objectives in the case of emergency services need to recognise and be balanced against the primary purposes of emergency services. It is seen to be outside of the remit of the Platform to make the best judgement on the appropriate balance between, on one hand - the goals of protecting and saving lives, health, assets and natural and cultural values- and on the other hand - the environmental protection and GHG emissions reductions. Nevertheless, for the emergency services activities to be recognised as Taxonomy aligned, environmental and climate considerations need to be integrated in emergency services planning, operations and coordination as part of DNSH approach.
- Due to the characteristics of immediacy and rapid decision-making during emergency response, the environmental and climate considerations need to be integrated starting from the early stages of emergency response planning, training of staff, defining response protocols as well as development of supporting systems and tools.
- Due to the considerations above, a self-assessment of climate and environmental impacts and early coordinated mitigating action planning and implementation involving environmental protection authorities and stakeholders via process based DNSH criteria is considered the most appropriate approach. Therefore, the criteria are designed around a requirement to develop a Climate Mitigation and Environmental Protection plans following a set of steps and covering all relevant mitigation and environmental impacts.
- To ensure that the required impact identification and action planning by emergency services operators addresses all other taxonomy objectives as relevant to the activity and has sufficient scope, the minimum key impact areas to be considered arelisted.
- Further important requirements are the analysis and transparent reporting on the level of improvement achievable by the planned actions, setting up of monitoring framework and reporting on action implementation and improvements achieved, and minimum quality and governance requirements.

- To ensure that specific potentially significant environmental impacts as identified per emergency service activity are included in the mandated plans, specific per-activity scope requirements are included.

7.4 Emergency services – Search and rescue

Description of the activity

Includes activities pertinent to emergency search and rescue response to climate-related disasters: search for, locate and rescue victims who may be a) trapped in a flooding situation, b) located under debris, c) lost, stranded and/or isolated with no capabilities or means of evacuation, d) missing and unaccounted for on land and in water. The activities should take into account acknowledged international guidelines, such as the International Search and Rescue Advisory Group (INSARAG) guidelines and may include these activities:

— ground, on-water and areal search, including with search dogs and/or technical search equipment,

— rescue, including lifting and moving

— breaking, breaching and cutting,

— technical rope,

— shoring.

Provision of lifesaving aid and delivery of first necessities as required in an emergency rescue context.

The activity scope includes preparedness activities directly related to emergency search and rescue and may include but is not limited to: development and update of emergency response plans; training and capacity building of search and rescue staff, service animals or volunteers; construction and maintenance of training facilities used for training to respond to climate change-attributable hazards; stockpiling and storage of materials and equipment necessary for search and rescue operations; construction, purchasing, upgrading and maintenance of infrastructure and equipment necessary for search and rescue operations; related educational and awareness-raising activities carried out by emergency search and rescue service providers in the community and/or targeted at selected stakeholders/target groups.

The scope excludes any of the above activities if they exclusively address search and rescue in relation to emergencies that cannot be attributed to current and future projected climatic factors.

The activity scope may include, but is not limited to NACE code(s):

84.25 Fire service activities

- …rescue of persons and animals… assistance in civic disasters, floods, road accidents etc., assistance in civic disasters, floods, road accidents etc

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Substantial contribution to climate change adaptation

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1. The economic activity has implemented physical and non-physical solutions ('adaptation solutions') that substantially reduce the most important physical climate risks that are material to that activity.

2.The physical climate risks that are material to the activity have been identified from those listed in Appendix A to Annex II of the Delegated Act[475] by performing a robust climate risk and vulnerability assessment with the following steps:

(a) screening of the activity to identify which physical climate risks from the list in Appendix A to Annex II of the Delegated Act may affect the performance of the economic activity during its expected lifetime;

(b) where the activity is assessed to be at risk from one or more of the physical climate risks listed in Appendix A to Annex II of the Delegated Act, a climate risk and vulnerability assessment to assess the materiality of the physical climate risks on the economic activity;

(c) an assessment of adaptation solutions that can reduce the identified physical climate risk.

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[475] COMMISSION DELEGATED REGULATION (EU) …/... supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council by establishing the technical screening criteria for determining the conditions under which an economic activity qualifies as contributing substantially to climate change mitigation or climate change adaptation and for determining whether that economic activity causes no significant harm to any of the other environmental objectives-C/2021/2800 final

The climate risk and vulnerability assessment is proportionate to the scale of the activity and its expected lifespan, such that:

(a) for activities with an expected lifespan of less than 10 years, the assessment is performed, at least by using climate projections at the smallest appropriate scale;

(b) for all other activities, the assessment is performed using the highest available resolution, state of-the-art climate projections across the existing range of future scenarios[476] consistent with the expected lifetime of the activity, including, at least, 10 to 30 years climate projections scenarios for major investments.

3. The climate projections and assessment of impacts are based on best practice and available guidance andtake into account the state-of-the-art science for vulnerability and risk analysis and related methodologies in line with the most recent Intergovernmental Panel on Climate Change reports[477], scientific peer-reviewed publications and open source[478] or paying models.

4.The adaptation solutions implemented:

(a) do not adversely affect the adaptation efforts or the level of resilience to physical climate risks of other people, of nature, of cultural heritage, of assets and of other economic activities;

[476] Future scenarios include Intergovernmental Panel on Climate Change representative concentration pathways RCP2.6, RCP4.5, RCP6.0 and RCP8.5.

[477] Assessments Reports on Climate Change: Impacts, Adaptation and Vulnerability, published periodically by the Intergovernmental Panel on Climate Change (IPCC), the United Nations body for assessing the science related to climate change produces, https://www.ipcc.ch/reports/.

[478] Such as Copernicus services managed by the European Commission.

(b) favour nature-based solutions[479] or rely on blue or green infrastructure[480] to the extent possible;

(c) are consistent with local, sectoral, regional or national adaptation plans and strategies;

(d) are monitored and measured against pre-defined indicators and remedial action is considered where those indicators are not met;

(e) where the solution implemented is physical and consists in an activity for which technical screening criteria have been specified in this Annex, the solution complies with the do no significant harm technical screening criteria for that activity.

5. In order for an activity to be considered as an enabling activity as referred to in Article 11(1), point (b), of Regulation (EU) 2020/852, the economic operator demonstrates, through an assessment of current and future climate risks, including uncertainty and based on robust data, , that the activity provides a technology, product, service, information, or practice, or promotes their uses with one of the following primary objectives:

(a) increasing the level of resilience to physical climate risks of other people, of nature, of cultural heritage, of assets and of other economic activities;

(b) contributing to adaptation efforts of other people, of nature, of cultural heritage, of assets and of other economic activities.

Do no significant harm ('DNSH')

[479] Nature-based solutions are defined as 'solutions that are inspired and supported by nature, which are cost-effective, simultaneously provide environmental, social and economic benefits and help build resilience. Such solutions bring more, and more diverse, nature and natural features and processes into cities, landscapes and seascapes, through locally adapted, resource-efficient and systemic interventions'. Therefore, nature-based solutions benefit biodiversity and support the delivery of a range of ecosystem services (version of [adoption date]: https://ec.europa.eu/info/research-and-innovation/research-area/environment/nature-based-solutions_en/).

[480] See Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Green Infrastructure (GI) — Enhancing Europe's Natural Capital (COM/2013/0249 final).

(1) Climate change mitigation	1.The operator of this activity has developed and implemented Climate Change Mitigation and Environmental Protection Plan following these steps: (a) Identification of key harmful climate and environmental impacts of their assets and operations, as a minimum for climate change mitigation including impacts in these categories: i) Scope 1 GHG emissions (direct GHG emissions occurring from sources that are owned or controlled by the operator including GHG emissions of land, water and air emergency transport) and ii) Scope 2 GHG emissions (GHG emissions from the generation of the electricity consumed by the operator); (b) Definition of the necessary measures to minimize the identified harmful impacts of the activity on climate and the environment in balance with the successful achievement of the main purpose of the emergency service. The plan is to explain the level of improvement achievable with the implementation of the proposed measures and include a time plan for the implementation of the full range of the identified measures; (c) Monitoring and documentation of the implementation of the identified measures in accordance with the time plan as well as monitoring and documentation of the level of improvements achieved. 2. The Climate Change Mitigation and Environmental Protection Plans: (a) Are based on best available scientific or equally rigorous other evidence, which is transparently reported; (b) To the extent applicable, employ the techniques included in the reference documents for the Best Available Techniques (BAT) –

	so-called BREF(s))[481] related to Article 13(1) of the Industrial Emissions Directive (IED, 2010/75/EU)[482] – or other techniques that demonstrably provide for an equivalent or higher level of environmental protection – to ensure emissions to air, water and soil are prevented / minimized; (c) Are developed in consultation with relevant stakeholders, including but not limited to environmental protection authorities; (d) Are updated if and when the characteristics and modus operandi of the activity change significantly, potentially altering the nature and/or scale of impacts on climate and the environment.
(3) Sustainable use and protection of water and marine resources	1.The operator of this activity has developed and implemented Climate Change Mitigation and Environmental Protection Plan following these steps: (a) Identification of key harmful climate and environmental impacts of their assets and operations, as a minimum for the objective of protecting water and marine resources including impacts in these categories: i) impacts on water and marine resources, including on the areas included in the Water Framework Directive registers of protected areas (Article 6, Directive 2000/60/EC or other equivalent national or international classifications/definitions); (b) Definition of the necessary measures to minimize the identified harmful impacts of the activity on climate and the environment in balance with the successful achievement of the main purpose of the emergency service. The plan is to explain the level of improvement achievable with the implementation of the

[481] https://eippcb.jrc.ec.europa.eu/reference/

[482] https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1579186952334&uri=CELEX:32010L0075

	proposed measures and include a time plan for the implementation of the full range of the identified measures; (c) Monitoring and documentation of the implementation of the identified measures in accordance with the time plan as well as monitoring and documentation of the level of improvements achieved. 2. The Climate Change Mitigation and Environmental Protection Plans: (a) Are based on best available scientific or equally rigorous other evidence, which is transparently reported; (b) To the extent applicable, employ the techniques included in the reference documents for the Best Available Techniques (BAT) – so-called BREF(s))[483] related to Article 13(1) of the Industrial Emissions Directive (IED, 2010/75/EU)[484] – or other techniques that demonstrably provide for an equivalent or higher level of environmental protection – to ensure emissions to air, water and soil are prevented / minimized; (c) Are developed in consultation with relevant stakeholders, including but not limited to environmental protection authorities; (d) Are updated if and when the characteristics and modus operandi of the activity change significantly, potentially altering the nature and/or scale of impacts on climate and the environment.
(4) Transition to a circular economy	1.The operator of this activity has developed and implemented Climate Change Mitigation and Environmental Protection Plan following these steps:

[483] https://eippcb.jrc.ec.europa.eu/reference/

[484] https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1579186952334&uri=CELEX:32010L0075

	(a) Identification of key harmful climate and environmental impacts of their assets and operations, as a minimum for transition to a circular economy objective including impacts in these categories: i) waste (as defined in the Commission Decision 2000/532/EC list of waste) generation, management, treatment; and ii) alignment with circular economy principles (reduction of landfilling, increased reuse and recycling of products, materials and resources). (b) Definition of the necessary measures to minimize the identified harmful impacts of the activity on climate and the environment in balance with the successful achievement of the main purpose of the emergency service. The plan is to explain the level of improvement achievable with the implementation of the proposed measures and include a time plan for the implementation of the full range of the identified measures; (c) Monitoring and documentation of the implementation of the identified measures in accordance with the time plan as well as monitoring and documentation of the level of improvements achieved. 2. The Climate Change Mitigation and Environmental Protection Plans: (a) Are based on best available scientific or equally rigorous other evidence, which is transparently reported; (b) To the extent applicable, employ the techniques included in the reference documents for the Best Available Techniques (BAT) – so-called BREF(s))[485] related to Article 13(1) of the Industrial Emissions Directive (IED, 2010/75/EU)[486] – or other techniques

[485] https://eippcb.jrc.ec.europa.eu/reference/

[486] https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1579186952334&uri=CELEX:32010L0075

	that demonstrably provide for an equivalent or higher level of environmental protection – to ensure emissions to air, water and soil are prevented / minimized; (c) Are developed in consultation with relevant stakeholders, including but not limited to environmental protection authorities; (d) Are updated if and when the characteristics and modus operandi of the activity change significantly, potentially altering the nature and/or scale of impacts on climate and the environment
(5) Pollution prevention and control	1.The operator of this activity has developed and implemented Climate Change Mitigation and Environmental Protection Plan following these steps: (a) Identification of key harmful climate and environmental impacts of their assets and operations, as a minimum for pollution prevention and control objective including impacts in these categories: i) polluting emissions to air, water or land as defined in Article 3(3) Directive 2010/75/EU; (b) Definition of the necessary measures to minimize the identified harmful impacts of the activity on climate and the environment in balance with the successful achievement of the main purpose of the emergency service. The plan is to explain the level of improvement achievable with the implementation of the proposed measures and include a time plan for the implementation of the full range of the identified measures; (c) Monitoring and documentation of the implementation of the identified measures in accordance with the time plan as well as monitoring and documentation of the level of improvements achieved. 2. The Climate Change Mitigation and Environmental Protection Plans:

	(a) Are based on best available scientific or equally rigorous other evidence, which is transparently reported; (b) To the extent applicable, employ the techniques included in the reference documents for the Best Available Techniques (BAT) – so-called BREF(s))[487] related to Article 13(1) of the Industrial Emissions Directive (IED, 2010/75/EU)[488] – or other techniques that demonstrably provide for an equivalent or higher level of environmental protection – to ensure emissions to air, water and soil are prevented / minimized; (c) Are developed in consultation with relevant stakeholders, including but not limited to environmental protection authorities; (d) Are updated if and when the characteristics and modus operandi of the activity change significantly, potentially altering the nature and/or scale of impacts on climate and the environment
(6) Protection and restoration of biodiversity and ecosystems	1.The operator of this activity has developed and implemented Climate Change Mitigation and Environmental Protection Plan following these steps: (a) Identification of key harmful climate and environmental impacts of their assets and operations, as a minimum for the protection and restoration of biodiversity and ecosystems objective including impacts in these categories: i) impacts on biodiversity and ecosystems, including on biodiversity-sensitive areas, such as Natura2000 areas (listed in the Natura 2000 Viewer) in accordance with the Habitats Directive (Article 3, Directive 92/43/EEC), Birds Directive (Article 4, Directive 2009/147/EC), and the Marine Strategy Framework

[487] https://eippcb.jrc.ec.europa.eu/reference/

[488] https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1579186952334&uri=CELEX:32010L0075

	Directive (Recital 6 and 7 and Article 21, Directive 2008/56/EC) (or other equivalent national or international classifications/definitions); (b) Definition of the necessary measures to minimize the identified harmful impacts of the activity on climate and the environment in balance with the successful achievement of the main purpose of the emergency service. The plan is to explain the level of improvement achievable with the implementation of the proposed measures and include a time plan for the implementation of the full range of the identified measures; (c) Monitoring and documentation of the implementation of the identified measures in accordance with the time plan as well as monitoring and documentation of the level of improvements achieved. 2. The Climate Change Mitigation and Environmental Protection Plans: (a) Are based on best available scientific or equally rigorous other evidence, which is transparently reported; (b) To the extent applicable, employ the techniques included in the reference documents for the Best Available Techniques (BAT) – so-called BREF(s))[489] related to Article 13(1) of the Industrial Emissions Directive (IED, 2010/75/EU)[490] – or other techniques that demonstrably provide for an equivalent or higher level of environmental protection – to ensure emissions to air, water and soil are prevented / minimized; (c) Are developed in consultation with relevant stakeholders, including but not limited to environmental protection authorities;

[489] https://eippcb.jrc.ec.europa.eu/reference/

[490] https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1579186952334&uri=CELEX:32010L0075

	Are updated if and when the characteristics and modus operandi of the activity change significantly, potentially altering the nature and/or scale of impacts on climate and the environment.

Rationale

On scope

- The highest SC to adaptation would be delivered if all aspects of civil protection – prevention, preparedness, response and recovery - are included in the taxonomy, however that would require inclusion of a very high number of economic activities and would likely overlap with many other activities already included or are currently being developed. Taken that several prevention and preparedness related economic activities are being worked on separately, it is considered sensible for this activity to be focused on disaster/emergency response.

- "Disaster response" definition EU: "any action taken [..] in the event of an imminent disaster, or during or after a disaster, to address its immediate adverse consequences."[491]

- The activity scope is aligned with the classification of the EU Civil Protection Mechanism framework.

- Where any of this activity also includes prevention and preparedness related actions carried out by the same operator who provides the identified emergency response, those would also be included and accounted for in the scope of this activity – to avoid unnecessarily detailed compartmentalisation meaning that the CapEx and OpEx and turnover related to these actions will be eligible to be reported as "taxonomy aligned".

- The system boundary is necessary for the definition of the scope of the activity and its sub-activities to clearly delineate between in-scope activities and the related up-stream (and down-stream) processes. The following rules apply for setting the system boundary of Emergency Services:

[491] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02013D1313-20210101

- The proposed activity system boundary is the service itself – all actions that are carried out as integral parts of the specific emergency service. This excludes upstream processes, such as all manufacturing and sales of goods and materials and machinery used in the implementation of these services (however, the service of, for example, stockpiling such goods would be seen as pertaining to the Emergency Services themselves and therefore within scope of this activity. Likewise excluded are supporting services, which themselves cannot be defined as one of the Emergency Services (these should be seen as activities that enable Emergency Services), e.g., the ICT services for setting up early warning systems.

- The actions and expenditure, which are clearly dedicated to emergency response that is not related (attributable) to current or future expected climate and do not contribute to emergency services activities in response to emergencies related to current or future climatic conditions, are excluded from this activity.

- In terms of geographic boundaries this activity includes emergency services that are carried out outside of Europe but are carried out by European actors.[492]

- Longer running services such as disaster relief and temporary housing camps, which are established after climate-related natural catastrophe or crisis and fall under the scope of disaster relief are also included in this activity.

- The activity description should precede the NACE code in importance for setting the activity scope and delimitations as there is no overall alignment with NACE classification for these activities.

On Substantial Contribution criteria

- Emergency services for search and rescue as an economic activity are highly vulnerable to climate change impacts – that is, climate change impacts render emergency services for search and rescue unable to fulfil their core purpose as they are not equipped to deal with the scale, nature and frequency of

[492] Note to reviewers: more work needs to be done on how the scenario when foreign operators carry out emergency response activities in Europe might affect adaptation taxonomy and its application.

emergencies in the changed climatic conditions, UNLESS the activity is itself adapted with a high priority. The high priority is due to both a) high direct vulnerability b) domino effects and significant increase of overall impacts across a territory if the activity is not adapted.

- Well-adapted emergency services for search and rescue increase the overall background resilience of an area and that leads to the overall background resilience of people and out in the area. This can be interpreted as an “enabling” contribution, however the enabling impact is diffuse throughout the territory and is not “directly” targeted to enable specific identifiable other economic activities, the link in this case is indirect and diffuse.

- Based on the two points above, the activity is to be included in the taxonomy as both high priority “adapted” and “enabling” activity.

- The SC criteria for adaptation for activities that need to be regarded as both adapted and enabling in TEG recommendations and in the 1st Delegated Act follow process-based approach, which is likewise deemed to be the most suitable for emergency services for search and rescue activities.

- The resilience to climate change of Emergency Services for search and rescue is ensured by implementing adaptation solutions for identified climate change risks safeguarding the continued effective operation of Emergency Services activities for search and rescue in the current and future climatic conditions without serious preventable failures, including when responding to natural hazards and emergencies exacerbated by climate change impacts. The implemented measures ensure the ability of Emergency Services for search and rescue activities’ to contribute substantially to reducing or preventing the adverse impact of the current or expected future climate, or the risks of such adverse impact, on people, cultural heritage, nature, assets and other economic activities within the EU and internationally.

On DNSH criteria

- The criteria for no significant harm to the climate and environmental objectives in the case of emergency services need to recognise and be balanced against the primary purposes of emergency services. It is seen to be outside of the remit of the Platform to make the best judgement on the appropriate balance

between, on one hand - the goals of protecting and saving lives, health, assets and natural and cultural values- and on the other hand - the environmental protection and GHG emissions reductions. Nevertheless, for the emergency services activities to be recognised as Taxonomy aligned, environmental and climate considerations need to be integrated in emergency services planning, operations and coordination as part of DNSH approach.

- Due to the characteristics of immediacy and rapid decision-making during emergency response, the environmental and climate considerations need to be integrated starting from the early stages of emergency response planning, training of staff, defining response protocols as well as development of supporting systems and tools.

- Due to the considerations above, a self-assessment of climate and environmental impacts and early coordinated mitigating action planning and implementation involving environmental protection authorities and stakeholders via process based DNSH criteria is considered the most appropriate approach. Therefore, the criteria are designed around a requirement to develop a Climate Mitigation and Environmental Protection plans following a set of steps and covering all relevant mitigation and environmental impacts.

- To ensure that the required impact identification and action planning by emergency services operators addresses all other taxonomy objectives as relevant to the activity and has sufficient scope, the minimum key impact areas to be considered are listed.

- Further important requirements are the analysis and transparent reporting on the level of improvement achievable by the planned actions, setting up of monitoring framework and reporting on action implementation and improvements achieved, and minimum quality and governance requirements.

- To ensure that specific potentially significant environmental impacts as identified per emergency service activity are included in the mandated plans, specific per-activity scope requirements are included.

7.5 Emergency services – Hazardous materials response

Description of the activity

The Hazardous materials detection and isolation:

- Identification of chemical and detection of radiological hazards through a combination of handheld, mobile and laboratory-based equipment

- gathering, handling and preparation of biological, chemical and radiological samples for further analyses elsewhere

- application of an appropriate scientific model to hazard prediction

Immediate risk reduction:

- hazard containment,

- hazard neutralisation,

- on-site treatment/decontamination of persons, animals and equipment

which may include immediate remedial action as per Environmental Liability Regulation (2004/35/CE) Art. 6 1(a) and include activities described in NACE code 39.00 when carried out during or in the intermediate aftermath of a hazardous material incident for immediate risk reduction purposes:

- decontamination of soils and groundwater at the place of pollution, either in situ or ex situ, using e.g., mechanical, chemical or biological methods

- decontamination of industrial plants or sites, including nuclear plants and sites

- decontamination and cleaning up of surface water following accidental pollution, e.g., through collection of pollutants or through application of chemicals

- cleaning up oil spills and other pollutions on land, in surface water, in ocean and seas, including coastal areas

- asbestos, lead paint, and other toxic material abatement

This activity excludes activities, which are deemed to be the responsibility of an operator liable for environmental damage according to the Environmental Liability Regulation (2004/35/CE)[493].

The activity scope includes preparedness activities directly related to hazardous materials response and may include but is not limited to: development and update of hazardous materials emergency response plans; training and capacity of hazardous materials response staff; construction and maintenance of training facilities used for training to respond to climate change-attributable hazards; stockpiling and storage of materials and equipment necessary for responding to hazardous materials emergencies; construction, purchasing, upgrading and maintenance of infrastructure and equipment necessary for responding to hazardous materials emergencies; related educational and awareness-raising activities carried out by hazardous materials response service providers in the community and/or targeted at selected stakeholders/target groups.

The scope excludes any of the above activities if they exclusively address hazardous materials emergencies that cannot be attributed to current and future projected climatic factors.

The activity scope may include, but is not limited to NACE code(s):

39.00 - Remediation activities and other waste management services

- decontamination of soils and groundwater at the place of pollution, either in situ or ex situ, using e.g., mechanical, chemical or biological methods

- decontamination of industrial plants or sites, including nuclear plants and sites

- decontamination and cleaning up of surface water following accidental pollution, e.g., through collection of pollutants or through application of chemicals

- cleaning up oil spills and other pollutions on land, in surface water, in ocean and seas, including coastal areas

- asbestos, lead paint, and other toxic material abatement.

[493] Clarification for reviewers: no specific article is cited, as the whole (most articles and annexes) directive applies to determine who, in which situation and how bears the environmental liability. Suggestions for narrowing down the reference to specific articles are welcome!

Activity “Hazardous Materials Response” includes activities that pertain to NACE code 39.00, and also comply with the Environmental Liability Regulation (2004/35/CE) Art. 6 1(a) definition of an immediate remedial action. i.e., actions taken during and immediately after an occurrence of the hazard. Long-term planned remedial measures that include activities described in NACE Code 39.00 fall under the scope of Taxonomy activity “Remediation”.

Substantial contribution to climate change adaptation

1. The economic activity has implemented physical and non-physical solutions (‘adaptation solutions’) that substantially reduce the most important physical climate risks that are material to that activity.

2.The physical climate risks that are material to the activity have been identified from those listed in Appendix A to Annex II of the Delegated Act[494] by performing a robust climate risk and vulnerability assessment with the following steps:

(a) screening of the activity to identify which physical climate risks from the list in Appendix A to Annex II of the Delegated Act may affect the performance of the economic activity during its expected lifetime;

(b) where the activity is assessed to be at risk from one or more of the physical climate risks listed in Appendix A to Annex II of the Delegated Act, a climate risk and vulnerability assessment to assess the materiality of the physical climate risks on the economic activity;

(c) an assessment of adaptation solutions that can reduce the identified physical climate risk.

The climate risk and vulnerability assessment is proportionate to the scale of the activity and its expected lifespan, such that:

[494] COMMISSION DELEGATED REGULATION (EU) …/... supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council by establishing the technical screening criteria for determining the conditions under which an economic activity qualifies as contributing substantially to climate change mitigation or climate change adaptation and for determining whether that economic activity causes no significant harm to any of the other environmental objectives-C/2021/2800 final

(a) for activities with an expected lifespan of less than 10 years, the assessment is performed, at least by using climate projections at the smallest appropriate scale;

(b) for all other activities, the assessment is performed using the highest available resolution, state of-the-art climate projections across the existing range of future scenarios[495] consistent with the expected lifetime of the activity, including, at least, 10 to 30 years climate projections scenarios for major investments.

3. The climate projections and assessment of impacts are based on best practice and available guidance andtake into account the state-of-the-art science for vulnerability and risk analysis and related methodologies in line with the most recent Intergovernmental Panel on Climate Change reports[496], scientific peer-reviewed publications and open source[497] or paying models.

4.The adaptation solutions implemented:

(a) do not adversely affect the adaptation efforts or the level of resilience to physical climate risks of other people, of nature, of cultural heritage, of assets and of other economic activities;

(b) favour nature-based solutions[498] or rely on blue or green infrastructure[499] to the extent possible;

(c) are consistent with local, sectoral, regional or national adaptation plans and strategies;

[495] Future scenarios include Intergovernmental Panel on Climate Change representative concentration pathways RCP2.6, RCP4.5, RCP6.0 and RCP8.5.

[496] Assessments Reports on Climate Change: Impacts, Adaptation and Vulnerability, published periodically by the Intergovernmental Panel on Climate Change (IPCC), the United Nations body for assessing the science related to climate change produces, https://www.ipcc.ch/reports/.

[497] Such as Copernicus services managed by the European Commission.

[498] Nature-based solutions are defined as 'solutions that are inspired and supported by nature, which are cost-effective, simultaneously provide environmental, social and economic benefits and help build resilience. Such solutions bring more, and more diverse, nature and natural features and processes into cities, landscapes and seascapes, through locally adapted, resource-efficient and systemic interventions'. Therefore, nature-based solutions benefit biodiversity and support the delivery of a range of ecosystem services (version of [adoption date]: https://ec.europa.eu/info/research-and-innovation/research-area/environment/nature-based-solutions_en/).

[499] See Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Green Infrastructure (GI) — Enhancing Europe's Natural Capital (COM/2013/0249 final).

(d) are monitored and measured against pre-defined indicators and remedial action is considered where those indicators are not met;

(e) where the solution implemented is physical and consists in an activity for which technical screening criteria have been specified in this Annex, the solution complies with the do no significant harm technical screening criteria for that activity.

5. In order for an activity to be considered as an enabling activity as referred to in Article 11(1), point (b), of Regulation (EU) 2020/852, the economic operator demonstrates, through an assessment of current and future climate risks, including uncertainty and based on robust data, , that the activity provides a technology, product, service, information, or practice, or promotes their uses with one of the following primary objectives:

(a) increasing the level of resilience to physical climate risks of other people, of nature, of cultural heritage, of assets and of other economic activities;

(b) contributing to adaptation efforts of other people, of nature, of cultural heritage, of assets and of other economic activities.

Do no significant harm ('DNSH')

(1) Climate change mitigation	1.The operator of this activity has developed and implemented Climate Change Mitigation and Environmental Protection Plan following these steps: (a) Identification of key harmful climate and environmental impacts of their assets and operations, as a minimum for climate change mitigation including impacts in these categories: 1) Scope 1 GHG emissions (direct GHG emissions occurring from sources that are owned or controlled by the operator) and 2) Scope 2 GHG emissions (GHG emissions from the generation of the electricity consumed by the operator); (b) Definition of the necessary measures to minimize the identified harmful impacts of the activity on climate and the environment in balance with the successful achievement of the main purpose of

	the emergency service. The plan is to explain the level of improvement achievable with the implementation of the proposed measures and include a time plan for the implementation of the full range of the identified measures; (c) Monitoring and documentation of the implementation of the identified measures in accordance with the time plan as well as monitoring and documentation of the level of improvements achieved. 2. The Climate Change Mitigation and Environmental Protection Plans: (a) Are based on best available scientific or equally rigorous other evidence, which is transparently reported; (b) To the extent applicable, employ the techniques included in the reference documents for the Best Available Techniques (BAT) – so-called BREF(s))[500] related to Article 13(1) of the Industrial Emissions Directive (IED, 2010/75/EU)[501] – or other techniques that demonstrably provide for an equivalent or higher level of environmental protection – to ensure emissions to air, water and soil are prevented / minimized; (c) Are developed in consultation with relevant stakeholders, including but not limited to environmental protection authorities; (d) Are updated if and when the characteristics and modus operandi of the activity change significantly, potentially altering the nature and/or scale of impacts on climate and the environment.

[500] https://eippcb.jrc.ec.europa.eu/reference/

[501] https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1579186952334&uri=CELEX:32010L0075

(3) Sustainable use and protection of water and marine resources	1.The operator of this activity has developed and implemented Climate Change Mitigation and Environmental Protection Plan following these steps: (a) Identification of key harmful climate and environmental impacts of their assets and operations, as a minimum for the objective of protecting water and marine resources including impacts in these categories: i) impacts on water and marine resources, including on the areas included in the Water Framework Directive registers of protected areas (Article 6, Directive 2000/60/EC or other equivalent national or international classifications/definitions); (b) Definition of the necessary measures to minimize the identified harmful impacts of the activity on climate and the environment in balance with the successful achievement of the main purpose of the emergency service. The plan is to explain the level of improvement achievable with the implementation of the proposed measures and include a time plan for the implementation of the full range of the identified measures; (c) Monitoring and documentation of the implementation of the identified measures in accordance with the time plan as well as monitoring and documentation of the level of improvements achieved. 2. The Climate Change Mitigation and Environmental Protection Plans: (a) Are based on best available scientific or equally rigorous other evidence, which is transparently reported; (b) To the extent applicable, employ the techniques included in the reference documents for the Best Available Techniques (BAT) –

	so-called BREF(s))[502] related to Article 13(1) of the Industrial Emissions Directive (IED, 2010/75/EU)[503] – or other techniques that demonstrably provide for an equivalent or higher level of environmental protection – to ensure emissions to air, water and soil are prevented / minimized; (c) Are developed in consultation with relevant stakeholders, including but not limited to environmental protection authorities; (d) Are updated if and when the characteristics and modus operandi of the activity change significantly, potentially altering the nature and/or scale of impacts on climate and the environment.
(4) Transition to a circular economy	1.The operator of this activity has developed and implemented Climate Change Mitigation and Environmental Protection Plan following these steps: (a) Identification of key harmful climate and environmental impacts of their assets and operations, as a minimum for transition to a circular economy objective including impacts in these categories: i) waste (as defined in the Commission Decision 2000/532/EC list of waste) generation, management, treatment; and ii) alignment with circular economy principles (reduction of landfilling, increased reuse and recycling of products, materials and resources). (b) Definition of the necessary measures to minimize the identified harmful impacts of the activity on climate and the environment in balance with the successful achievement of the main purpose of the emergency service. The plan is to explain the level of improvement achievable with the implementation of the

[502] https://eippcb.jrc.ec.europa.eu/reference/

[503] https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1579186952334&uri=CELEX:32010L0075

	proposed measures and include a time plan for the implementation of the full range of the identified measures; (c) Monitoring and documentation of the implementation of the identified measures in accordance with the time plan as well as monitoring and documentation of the level of improvements achieved. 2. The Climate Change Mitigation and Environmental Protection Plans: (a) Are based on best available scientific or equally rigorous other evidence, which is transparently reported; (b) To the extent applicable, employ the techniques included in the reference documents for the Best Available Techniques (BAT) – so-called BREF(s))[504] related to Article 13(1) of the Industrial Emissions Directive (IED, 2010/75/EU)[505] – or other techniques that demonstrably provide for an equivalent or higher level of environmental protection – to ensure emissions to air, water and soil are prevented / minimized; (c) Are developed in consultation with relevant stakeholders, including but not limited to environmental protection authorities; (d) Are updated if and when the characteristics and modus operandi of the activity change significantly, potentially altering the nature and/or scale of impacts on climate and the environment.
(5) Pollution prevention and control	1.The operator of this activity has developed and implemented Climate Change Mitigation and Environmental Protection Plan following these steps:

[504] https://eippcb.jrc.ec.europa.eu/reference/

[505] https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1579186952334&uri=CELEX:32010L0075

	(a) Identification of key harmful climate and environmental impacts of their assets and operations, as a minimum minimum for pollution prevention and control objective including impacts in these categories: i) polluting emissions to air, water or land as defined in Article 3(3) Directive 2010/75/EU; (b) Definition of the necessary measures to minimize the identified harmful impacts of the activity on climate and the environment in balance with the successful achievement of the main purpose of the emergency service. The plan is to explain the level of improvement achievable with the implementation of the proposed measures and include a time plan for the implementation of the full range of the identified measures; (c) Monitoring and documentation of the implementation of the identified measures in accordance with the time plan as well as monitoring and documentation of the level of improvements achieved. 2. The Climate Change Mitigation and Environmental Protection Plans: (a) Are based on best available scientific or equally rigorous other evidence, which is transparently reported; (b) To the extent applicable, employ the techniques included in the reference documents for the Best Available Techniques (BAT) – so-called BREF(s))[506] related to Article 13(1) of the Industrial Emissions Directive (IED, 2010/75/EU)[507] – or other techniques that demonstrably provide for an equivalent or higher level of environmental protection – to ensure emissions to air, water and soil are prevented / minimized; (c) Are developed in consultation with relevant stakeholders, including but not limited to environmental protection authorities;

[506] https://eippcb.jrc.ec.europa.eu/reference/

[507] https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1579186952334&uri=CELEX:32010L0075

	(d) Are updated if and when the characteristics and modus operandi of the activity change significantly, potentially altering the nature and/or scale of impacts on climate and the environment.
(6) Protection and restoration of biodiversity and ecosystems	1.The operator of this activity has developed and implemented Climate Change Mitigation and Environmental Protection Plan following these steps: (a) Identification of key harmful climate and environmental impacts of their assets and operations, as a minimum for the protection and restoration of biodiversity and ecosystems objective including impacts in these categories: i) impacts on biodiversity and ecosystems, including on biodiversity-sensitive areas, such as Natura2000 areas (listed in the Natura 2000 Viewer) in accordance with the Habitats Directive (Article 3, Directive 92/43/EEC), Birds Directive (Article 4, Directive 2009/147/EC), and the Marine Strategy Framework Directive (Recital 6 and 7 and Article 21, Directive 2008/56/EC) (or other equivalent national or international classifications/definitions), including impacts high biodiversity value areas due to inadvertent introduction/spills of hazardous materials or due to failure to protect during hazardous materials response. (b) Definition of the necessary measures to minimize the identified harmful impacts of the activity on climate and the environment in balance with the successful achievement of the main purpose of the emergency service, including planned actions to minimize the risks to biodiversity-sensitive areas, for example, by integrating spatial information on biodiversity-sensitive areas and principles of care in hazardous materials response planning.. The plan is to explain the level of improvement achievable with the implementation of the proposed measures and include a time plan for the implementation of the full range of the identified measures; (c) Monitoring and documentation of the implementation of the identified measures in accordance with the time plan as well as

	monitoring and documentation of the level of improvements achieved. 2. The Climate Change Mitigation and Environmental Protection Plans: (a) Are based on best available scientific or equally rigorous other evidence, which is transparently reported; (b) To the extent applicable, employ the techniques included in the reference documents for the Best Available Techniques (BAT) – so-called BREF(s))[508] related to Article 13(1) of the Industrial Emissions Directive (IED, 2010/75/EU)[509] – or other techniques that demonstrably provide for an equivalent or higher level of environmental protection – to ensure emissions to air, water and soil are prevented / minimized; (c) Are developed in consultation with relevant stakeholders, including but not limited to environmental protection authorities; Are updated if and when the characteristics and modus operandi of the activity change significantly, potentially altering the nature and/or scale of impacts on climate and the environment.

Rationale

On scope

- The highest SC to adaptation would be delivered if all aspects of civil protection – prevention, preparedness, response and recovery - are included in the taxonomy, however that would require inclusion of a very high number of economic activities and would likely overlap with many other activities already included or are currently being developed. Taken that several prevention and preparedness related economic activities are being worked on separately, it is considered sensible for this activity to be focused on disaster/emergency response.
- "Disaster response" definition EU: "any action taken [..] in the event of an imminent disaster, or during or after a disaster, to address its immediate adverse consequences."[510]

[508] https://eippcb.jrc.ec.europa.eu/reference/

[509] https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1579186952334&uri=CELEX:32010L0075

[510] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02013D1313-20210101

- The activity scope is aligned with the classification of the EU Civil Protection Mechanism framework.
- Where this activity also includes prevention and preparedness related actions carried out by the same operator who provides the identified emergency response, those would also be included and accounted for in the scope of this activity – to avoid unnecessarily detailed compartmentalisation, meaning that the CapEx and OpEx and turnover related to these actions will be eligible to be reported as "taxonomy aligned".
- The system boundary is necessary for the definition of the scope of the activity and its sub-activities to clearly delineate between in-scope activities and the related up-stream (and down-stream) processes. The following rules apply for setting the system boundary of Emergency Services:
    - The proposed activity system boundary is the service itself – all actions that are carried out as integral parts of the specific emergency service. This excludes upstream processes, such as all manufacturing and sales of goods and materials and machinery used in the implementation of these services (however, the service of, for example, stockpiling such goods would be seen as pertaining to the Emergency Services themselves and therefore within scope of this activity. Likewise excluded are supporting services, which themselves cannot be defined as one of the Emergency Services (these should be seen as activities that enable Emergency Services), e.g., the ICT services for setting up early warning systems.
    - The actions and expenditure, which are clearly dedicated to emergency response that is not related (attributable) to current or future expected climate and do not contribute to emergency services activities in response to emergencies related to current or future climatic conditions, are excluded from this activity.
    - In terms of geographic boundaries this activity includes emergency services that are carried out outside of Europe but are carried out by European actors.[511]
- The activity description should precede the NACE code in importance for setting the activity scope and delimitations as there is no overall alignment with NACE classification for these activities.

On Substantial Contribution criteria

- Emergency services for hazardous material response as an economic activity are highly vulnerable to climate change impacts – that is, climate change impacts render emergency services for hazardous material response unable to fulfil their core purpose as they are not equipped to deal with the scale, nature and frequency of emergencies in the changed climatic conditions, UNLESS the activity is itself adapted with a high priority. The high priority is due to both a) high direct vulnerability b)

[511] Note to reviewers: more work needs to be done on how the scenario when foreign operators carry out emergency response activities in Europe might affect adaptation taxonomy and its application.

domino effects and significant increase of overall impacts across a territory if the activity is not adapted.

- Well-adapted emergency services for hazardous material response increase the overall background resilience of an area and that leads to the overall background resilience of most economic activities carried out in the area. This can be interpreted as an “enabling” contribution, however the enabling impact is diffuse throughout the territory and is not “directly” targeted to enable specific identifiable other economic activities, the link in this case is indirect and diffuse.
- Based on the two points above, the activity is to be included in the taxonomy as both high priority “adapted” and “enabling” activity.
- The SC criteria for adaptation for activities that need to be regarded as both adapted and enabling in TEG recommendations and in the 1st Delegated Act follow process-based approach, which is likewise deemed to be the most suitable for emergency services for hazardous material response activities.
- The resilience to climate change of Emergency Services for hazardous material response is ensured by implementing adaptation solutions for identified climate change risks safeguarding the continued effective operation of Emergency Services for hazardous material response activities in the current and future climatic conditions without serious preventable failures, including when responding to natural hazards and emergencies exacerbated by climate change impacts. The implemented measures ensure the ability of Emergency Services for hazardous material response activities’ to contribute substantially to reducing or preventing the adverse impact of the current or expected future climate, or the risks of such adverse impact, on people, cultural heritage, nature, assets and other economic activities within the EU and internationally.

ON DNSH criteria

- The criteria for no significant harm to the climate and environmental objectives in the case of emergency services need to recognise and be balanced against the primary purposes of emergency services. It is seen to be outside of the remit of the Platform to make the best judgement on the appropriate balance between, on one hand - the goals of protecting and saving lives, health, assets and natural and cultural values- and on the other hand - the environmental protection and GHG emissions reductions. Nevertheless, for the emergency services activities to be recognised as Taxonomy aligned, environmental and climate considerations need to be integrated in emergency services planning, operations and coordination as part of DNSH approach.
- Due to the characteristics of immediacy and rapid decision-making during emergency response, the environmental and climate considerations need to be integrated starting from the early stages of emergency response planning, training of staff, defining response protocols as well as development of supporting systems and tools.
- Due to the considerations above, a self-assessment of climate and environmental impacts and early coordinated mitigating action planning and implementation involving environmental protection authorities and stakeholders via process based DNSH criteria is considered the most appropriate approach. Therefore, the criteria are designed around a requirement to develop a Climate Mitigation and

Environmental Protection plans following a set of steps and covering all relevant mitigation and environmental impacts.

- To ensure that the required impact identification and action planning by emergency services operators addresses all other taxonomy objectives as relevant to the activity and has sufficient scope, the minimum key areas to be considered are listed.
- Further important requirements are the analysis and transparent reporting on the level of improvement achievable by the planned actions, setting up of monitoring framework and reporting on action implementation and improvements achieved, and minimum quality and governance requirements.
- To ensure that specific potentially significant environmental impacts as identified per emergency service activity are included in the mandated plans, specific per-activity scope requirements are included

7.6 Emergency services – Firefighting

Description of the activity

Firefighting and fire prevention: administration and operation of regular and auxiliary fire brigades in fire prevention and firefighting, including ground, on-water and aerial firefighting.

The activity scope includes preparedness activities directly related to firefighting and may include but is not limited to: development and update of fire emergency response plans; training and capacity of firefighting staff or volunteer firefighters; construction and maintenance of training facilities used for training to respond to climate change-attributable fire hazards; stockpiling and storage of materials and equipment necessary for responding to fire emergencies; construction, purchasing, upgrading and maintenance of infrastructure and equipment necessary for responding to fire emergencies; installation, repairs and maintenance and remote monitoring of fire alarms and warning systems; related educational and awareness raising activities carried out by firefighting service providers in the community and/or targeted at selected stakeholders/target groups.

The scope excludes any of the above activities if they exclusively address fire hazards that cannot be attributed to current and future projected climatic factors.

The activity scope may include, but is not limited to NACE code(s):

84.25 Fire service activities

- fire fighting and fire prevention: administration and operation of regular and auxiliary fire brigades in fire prevention, fire fighting, (..)

02.40 - Support services to forestry

- forestry service activities: (..) forest fire fighting and protection (..)

Forest firefighting activities under NACE code 02.40 are included in this activity scope when they are carried out by dedicated firefighting services, whose primary purpose is firefighting and emergency response, if these activities are carried out by forest owners or managers, they are included in the scope of activity “Forestry”.

80.20 - Security systems service activities (prevention-oriented activity)

- monitoring or remote monitoring of electronic security alarm systems, such as (..) fire alarms, including their installation and maintenance - installing, repairing, rebuilding, and adjusting mechanical or electronic locking devices, safes and security vaults in connection with later monitoring and remote monitoring

52.23 Service activities incidental to air transportation

- firefighting and fire-prevention services at airports

The following NACE code element is excluded from the activity scope:

09.10 Support activities for petroleum and natural gas extraction

- oil and gas field fire fighting services

Substantial contribution to climate change adaptation

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1. The economic activity has implemented physical and non-physical solutions (‘adaptation solutions’) that substantially reduce the most important physical climate risks that are material to that activity.

2.The physical climate risks that are material to the activity have been identified from those listed in Appendix A to Annex II of the Delegated Act[512] by performing a robust climate risk and vulnerability assessment with the following steps:

(a) screening of the activity to identify which physical climate risks from the list in Appendix A to Annex II of the Delegated Act may affect the performance of the economic activity during its expected lifetime;

(b) where the activity is assessed to be at risk from one or more of the physical climate risks listed in Appendix A to Annex II of the Delegated Act, a climate risk and vulnerability assessment to assess the materiality of the physical climate risks on the economic activity;

(c) an assessment of adaptation solutions that can reduce the identified physical climate risk.

The climate risk and vulnerability assessment is proportionate to the scale of the activity and its expected lifespan, such that:

(a) for activities with an expected lifespan of less than 10 years, the assessment is performed, at least by using climate projections at the smallest appropriate scale;

(b) for all other activities, the assessment is performed using the highest available resolution, state of-the-art climate projections across the existing range of future scenarios[513] consistent with the expected lifetime of the activity, including, at least, 10 to 30 years climate projections scenarios for major investments.

3. The climate projections and assessment of impacts are based on best practice and available guidance and take into account the state-of-the-art science for vulnerability and risk analysis

[512] COMMISSION DELEGATED REGULATION (EU) …/... supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council by establishing the technical screening criteria for determining the conditions under which an economic activity qualifies as contributing substantially to climate change mitigation or climate change adaptation and for determining whether that economic activity causes no significant harm to any of the other environmental objectives-C/2021/2800 final

[513] Future scenarios include Intergovernmental Panel on Climate Change representative concentration pathways RCP2.6, RCP4.5, RCP6.0 and RCP8.5.

and related methodologies in line with the most recent Intergovernmental Panel on Climate Change reports[514], scientific peer-reviewed publications and open source[515] or paying models.

4.The adaptation solutions implemented:

(a) do not adversely affect the adaptation efforts or the level of resilience to physical climate risks of other people, of nature, of cultural heritage, of assets and of other economic activities;

(b) favour nature-based solutions[516] or rely on blue or green infrastructure[517] to the extent possible;

(c) are consistent with local, sectoral, regional or national adaptation plans and strategies;

(d) are monitored and measured against pre-defined indicators and remedial action is considered where those indicators are not met;

(e) where the solution implemented is physical and consists in an activity for which technical screening criteria have been specified in this Annex, the solution complies with the do no significant harm technical screening criteria for that activity.

5. In order for an activity to be considered as an enabling activity as referred to in Article 11(1), point (b), of Regulation (EU) 2020/852, the economic operator demonstrates, through an assessment of current and future climate risks, including uncertainty and based on robust data,

[514] Assessments Reports on Climate Change: Impacts, Adaptation and Vulnerability, published periodically by the Intergovernmental Panel on Climate Change (IPCC), the United Nations body for assessing the science related to climate change produces, https://www.ipcc.ch/reports/.

[515] Such as Copernicus services managed by the European Commission.

[516] Nature-based solutions are defined as 'solutions that are inspired and supported by nature, which are cost-effective, simultaneously provide environmental, social and economic benefits and help build resilience. Such solutions bring more, and more diverse, nature and natural features and processes into cities, landscapes and seascapes, through locally adapted, resource-efficient and systemic interventions'. Therefore, nature-based solutions benefit biodiversity and support the delivery of a range of ecosystem services (version of [adoption date]: https://ec.europa.eu/info/research-and-innovation/research-area/environment/nature-based-solutions_en/).

[517] See Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Green Infrastructure (GI) — Enhancing Europe's Natural Capital (COM/2013/0249 final).

, that the activity provides a technology, product, service, information, or practice, or promotes their uses with one of the following primary objectives: (a) increasing the level of resilience to physical climate risks of other people, of nature, of cultural heritage, of assets and of other economic activities; (b) contributing to adaptation efforts of other people, of nature, of cultural heritage, of assets and of other economic activities.

Do no significant harm (‘DNSH’)	
(1) Climate change mitigation	1.The operator of this activity has developed and implemented Climate Change Mitigation and Environmental Protection Plan following these steps: (a) Identification of key harmful climate and environmental impacts of their assets and operations, as a minimum for climate change mitigation including impacts in these categories: i) Scope 1 GHG emissions (direct GHG emissions occurring from sources that are owned or controlled by the operator including GHG emissions of land, water and air firefighting machinery and transport) and ii) Scope 2 GHG emissions (GHG emissions from the generation of the electricity consumed by the operator); (b) Definition of the necessary measures to minimize the identified harmful impacts of the activity on climate and the environment in balance with the successful achievement of the main purpose of the emergency service. The plan is to explain the level of improvement achievable with the implementation of the proposed measures and include a time plan for the implementation of the full range of the identified measures; (c) Monitoring and documentation of the implementation of the identified measures in accordance with the time plan as well as

	monitoring and documentation of the level of improvements achieved. 2. The Climate Change Mitigation and Environmental Protection Plans: (a) Are based on best available scientific or equally rigorous other evidence, which is transparently reported; (b) To the extent applicable, employ the techniques included in the reference documents for the Best Available Techniques (BAT) – so-called BREF(s))[518] related to Article 13(1) of the Industrial Emissions Directive (IED, 2010/75/EU)[519] – or other techniques that demonstrably provide for an equivalent or higher level of environmental protection – to ensure emissions to air, water and soil are prevented / minimized; (c) Are developed in consultation with relevant stakeholders, including but not limited to environmental protection authorities; (d) Are updated if and when the characteristics and modus operandi of the activity change significantly, potentially altering the nature and/or scale of impacts on climate and the environment.
(3) Sustainable use and protection of water and marine resources	1.The operator of this activity has developed and implemented Climate Change Mitigation and Environmental Protection Plan following these steps: (a) Identification of key harmful climate and environmental impacts of their assets and operations, as a minimum for the objective of protecting water and marine resources including impacts in these categories:

[518] https://eippcb.jrc.ec.europa.eu/reference/

[519] https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1579186952334&uri=CELEX:32010L0075

	i) impacts on water and marine resources, including on the areas included in the Water Framework Directive registers of protected areas (Article 6, Directive 2000/60/EC or other equivalent national or international classifications/definitions), including the negative impacts of harmful substances in firefighting foams, fire extinguishing agents, fire retardants on water resources. (b) Definition of the necessary measures to minimize the identified harmful impacts of the activity on climate and the environment in balance with the successful achievement of the main purpose of the emergency service, including planned actions to counteract impacts of harmful substance on water resources by, eliminating the use of foams containing PFAS (Per- and polyfluoroalkyl substances), integrating the principles of targeted application (in time and area treated) and delivery at appropriate levels (with preference to physical or other non-chemical methods if possible) in emergency response planning. The plan is to explain the level of improvement achievable with the implementation of the proposed measures and include a time plan for the implementation of the full range of the identified measures; (c) Monitoring and documentation of the implementation of the identified measures in accordance with the time plan as well as monitoring and documentation of the level of improvements achieved. 2. The Climate Change Mitigation and Environmental Protection Plans: (a) Are based on best available scientific or equally rigorous other evidence, which is transparently reported; (b) To the extent applicable, employ the techniques included in the reference documents for the Best Available Techniques (BAT) –

	so-called BREF(s))[520] related to Article 13(1) of the Industrial Emissions Directive (IED, 2010/75/EU)[521] – or other techniques that demonstrably provide for an equivalent or higher level of environmental protection – to ensure emissions to air, water and soil are prevented / minimized; (c) Are developed in consultation with relevant stakeholders, including but not limited to environmental protection authorities; (d) Are updated if and when the characteristics and modus operandi of the activity change significantly, potentially altering the nature and/or scale of impacts on climate and the environment.
(4) Transition to a circular economy	1.The operator of this activity has developed and implemented Climate Change Mitigation and Environmental Protection Plan following these steps: (a) Identification of key harmful climate and environmental impacts of their assets and operations, as a minimum minimum for transition to a circular economy objective including impacts in these categories: i) waste (as defined in the Commission Decision 2000/532/EC list of waste) generation, management, treatment; and ii) alignment with circular economy principles (reduction of landfilling, increased reuse and recycling of products, materials and resources). (b) Definition of the necessary measures to minimize the identified harmful impacts of the activity on climate and the environment in balance with the successful achievement of the main

[520] https://eippcb.jrc.ec.europa.eu/reference/

[521] https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1579186952334&uri=CELEX:32010L0075

purpose of the emergency service. The plan is to explain the level of improvement achievable with the implementation of the proposed measures and include a time plan for the implementation of the full range of the identified measures;

(c) Monitoring and documentation of the implementation of the identified measures in accordance with the time plan as well as monitoring and documentation of the level of improvements achieved.

2. The Climate Change Mitigation and Environmental Protection Plans:

(a) Are based on best available scientific or equally rigorous other evidence, which is transparently reported;

(b) To the extent applicable, employ the techniques included in the reference documents for the Best Available Techniques (BAT) – so-called BREF(s))[522] related to Article 13(1) of the Industrial Emissions Directive (IED, 2010/75/EU)[523] – or other techniques that demonstrably provide for an equivalent or higher level of environmental protection – to ensure emissions to air, water and soil are prevented / minimized;

(c) Are developed in consultation with relevant stakeholders, including but not limited to environmental protection authorities;

(d) Are updated if and when the characteristics and modus operandi of the activity change significantly, potentially altering the nature and/or scale of impacts on climate and the environment.

[522] https://eippcb.jrc.ec.europa.eu/reference/

[523] https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1579186952334&uri=CELEX:32010L0075

(5) Pollution prevention and control	1.The operator of this activity has developed and implemented Climate Change Mitigation and Environmental Protection Plan following these steps: (a) Identification of key harmful climate and environmental impacts of their assets and operations, as a minimum for pollution prevention and control objective including impacts in these categories: i) polluting emissions to air, water or land as defined in Article 3(3) Directive 2010/75/EU, including the negative impacts of harmful substances in firefighting foams/fire extinguishing agents/fire retardants on, environmental pollution levels. (b) Definition of the necessary measures to minimize the identified harmful impacts of the activity on climate and the environment in balance with the successful achievement of the main purpose of the emergency service. The plan is to explain the level of improvement achievable with the implementation of the proposed measures and include a time plan for the implementation of the full range of the identified measures; (c) Monitoring and documentation of the implementation of the identified measures in accordance with the time plan as well as monitoring and documentation of the level of improvements achieved. 2. The Climate Change Mitigation and Environmental Protection Plans: (a) Are based on best available scientific or equally rigorous other evidence, which is transparently reported; (b) To the extent applicable, employ the techniques included in the reference documents for the Best Available Techniques (BAT) –

	so-called BREF(s))[524] related to Article 13(1) of the Industrial Emissions Directive (IED, 2010/75/EU)[525] – or other techniques that demonstrably provide for an equivalent or higher level of environmental protection – to ensure emissions to air, water and soil are prevented / minimized; (c) Are developed in consultation with relevant stakeholders, including but not limited to environmental protection authorities; (d) Are updated if and when the characteristics and modus operandi of the activity change significantly, potentially altering the nature and/or scale of impacts on climate and the environment.
(6) Protection and restoration of biodiversity and ecosystems	1.The operator of this activity has developed and implemented Climate Change Mitigation and Environmental Protection Plan following these steps: (a) Identification of key harmful climate and environmental impacts of their assets and operations, as a minimum for the protection and restoration of biodiversity and ecosystems objective including impacts in these categories: i) impacts on biodiversity and ecosystems, including on biodiversity-sensitive areas, such as Natura2000 areas (listed in the Natura 2000 Viewer) in accordance with the Habitats Directive (Article 3, Directive 92/43/EEC), Birds Directive (Article 4, Directive 2009/147/EC), and the Marine Strategy Framework Directive (Recital 6 and 7 and Article 21, Directive 2008/56/EC) (or other equivalent national or international classifications/definitions) during firefighting operations or due to the failure to protect these areas from the damage of fire.;

[524] https://eippcb.jrc.ec.europa.eu/reference/

[525] https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1579186952334&uri=CELEX:32010L0075

	(b) Definition of the necessary measures to minimize the identified harmful impacts of the activity on climate and the environment in balance with the successful achievement of the main purpose of the emergency service, including planned actions to minimize the risks to biodiversity-sensitive areas, for example, by integrating spatial information on biodiversity-sensitive areas and principles of care in firefighting response planning. The plan is to explain the level of improvement achievable with the implementation of the proposed measures and include a time plan for the implementation of the full range of the identified measures; (c) Monitoring and documentation of the implementation of the identified measures in accordance with the time plan as well as monitoring and documentation of the level of improvements achieved. 2. The Climate Change Mitigation and Environmental Protection Plans: (a) Are based on best available scientific or equally rigorous other evidence, which is transparently reported; (b) To the extent applicable, employ the techniques included in the reference documents for the Best Available Techniques (BAT) – so-called BREF(s))[526] related to Article 13(1) of the Industrial Emissions Directive (IED, 2010/75/EU)[527] – or other techniques that demonstrably provide for an equivalent or higher level of environmental protection – to ensure emissions to air, water and soil are prevented / minimized; (c) Are developed in consultation with relevant stakeholders, including but not limited to environmental protection authorities;

[526] https://eippcb.jrc.ec.europa.eu/reference/

[527] https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1579186952334&uri=CELEX:32010L0075

	(d) Are updated if and when the characteristics and modus operandi of the activity change significantly, potentially altering the nature and/or scale of impacts on climate and the environment.

Rationale

On scope

- The highest SC to adaptation would be delivered if all aspects of civil protection – prevention, preparedness, response and recovery - are included in the taxonomy, however that would require inclusion of a very high number of economic activities and would likely overlap with many other activities already included or are currently being developed. Taken that several prevention and preparedness related economic activities are being worked on separately, it is considered sensible for this activity to be focused on disaster/emergency response.
- "Disaster response" definition EU: "any action taken [..] in the event of an imminent disaster, or during or after a disaster, to address its immediate adverse consequences."[528]
- The activity scope is aligned with the classification of the EU Civil Protection Mechanism framework.
- Where any of this activity also includes prevention and preparedness related actions carried out by the same operator who provides the identified emergency response, those would also be included and accounted for in the scope of this activity – to avoid unnecessarily detailed compartmentalisation. For example, if a firefighting service provider is carrying out a training activity to enhance the abilities of firefighters (preparedness) or carries out fire-prevention activities (e.g., controlled burning for the reduction of fuel load) (prevention), these actions are accounted for in the scope of this activity, meaning that the CapEx and OpEx and turnover related to these actions will be eligible to be reported as "taxonomy aligned".

[528] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02013D1313-20210101

- The system boundary is necessary for the definition of the scope of the activity and its sub-activities to clearly delineate between in-scope activities and the related up-stream (and down-stream) processes. The following rules apply for setting the system boundary of Emergency Services:
    - The proposed activity system boundary is the service itself – all actions that are carried out as integral parts of the specific emergency service. This excludes upstream processes, such as all manufacturing and sales of goods and materials and machinery used in the implementation of these services (however, the service of, for example, stockpiling such goods would be seen as pertaining to the Emergency Services themselves and therefore within scope of this activity. Likewise excluded are supporting services, which themselves cannot be defined as one of the Emergency Services (these should be seen as activities that enable Emergency Services), e.g., the ICT services for setting up early warning systems.
    - The actions and expenditure, which are clearly dedicated to emergency response that is not related (attributable) to current or future expected climate and do not contribute to emergency services activities in response to emergencies related to current or future climatic conditions, are excluded from this activity.
    - In terms of geographic boundaries this activity includes emergency services that are carried out outside of Europe but are carried out by European actors.[529]
- The activity description should precede the NACE code in importance for setting the activity scope and delimitations as there is no overall alignment with NACE classification for these activities.

On Substantial Contribution criteria

- Firefighting Emergency services as an economic activity are highly vulnerable to climate change impacts – that is, climate change impacts render firefighting emergency services unable to fulfil their core purpose as they are not equipped to deal with the scale, nature and frequency of emergencies in the changed climatic conditions, UNLESS the activity is itself adapted with a high priority. The high priority is due to both

[529] Note to reviewers: more work needs to be done on how the scenario when foreign operators carry out emergency response activities in Europe might affect adaptation taxonomy and its application.

a) high direct vulnerability b) domino effects and significant increase of overall impacts across a territory if the activity is not adapted.

- Well-adapted firefighting emergency services increase the overall background resilience of an area and that leads to the overall background resilience of most economic activities carried out in the area. This can be interpreted as an “enabling” contribution, however the enabling impact is diffuse throughout the territory and is not “directly” targeted to enable specific identifiable other economic activities, the link in this case is indirect and diffuse.
- Based on the two points above, the activity is to be included in the taxonomy as both high priority “adapted” and “enabling” activity.
- The SC criteria for adaptation for activities that need to be regarded as both adapted and enabling in TEG recommendations and in the 1st Delegated Act follow process-based approach, which is likewise deemed to be the most suitable for firefighting emergency services activities.
- The resilience to climate change of firefighting Emergency Services is ensured by implementing adaptation solutions for identified climate change risks safeguarding the continued effective operation of firefighting Emergency Services activities in the current and future climatic conditions without serious preventable failures, including when responding to natural hazards and emergencies exacerbated by climate change impacts. The implemented measures ensure the ability of firefighting Emergency Services activities’ to contribute substantially to reducing or preventing the adverse impact of the current or expected future climate, or the risks of such adverse impact, on people, cultural heritage, nature, assets and other economic activities within the EU and internationally.

On DNSH criteria

- The criteria for no significant harm to the climate and environmental objectives in the case of emergency services need to recognise and be balanced against the primary purposes of emergency services. It is seen to be outside of the remit of the Platform to make the best judgement on the appropriate balance between, on one hand - the goals of protecting and saving lives, health, assets and natural and cultural values- and on the other hand - the environmental protection and GHG emissions reductions. Nevertheless, for the emergency services activities to be recognised as Taxonomy aligned, environmental and climate considerations need to be integrated in emergency services planning, operations and coordination as part of DNSH approach.

- Due to the characteristics of immediacy and rapid decision-making during emergency response, the environmental and climate considerations need to be integrated starting from the early stages of emergency response planning, training of staff, defining response protocols as well as development of supporting systems and tools.
- Due to the considerations above, a self-assessment of climate and environmental impacts and early coordinated mitigating action planning and implementation involving environmental protection authorities and stakeholders via process-\based DNSH criteria is considered the most appropriate approach. Therefore, the criteria are designed around a requirement to develop a Climate Mitigation and Environmental Protection plans following a set of steps and covering all relevant mitigation and environmental impacts.
- To ensure that the required impact identification and action planning by emergency services operators addresses all other taxonomy objectives as relevant to the activity and has sufficient scope, the minimum key impact areas to be considered is listed.
- Further important requirements are the analysis and transparent reporting on the level of improvement achievable by the planned actions, setting up of monitoring framework and reporting on action implementation and improvements achieved, and minimum quality and governance requirements.
- To ensure that specific potentially significant environmental impacts as identified per emergency service activity are included in the mandated plans, specific per-activity scope requirements are included.

7.7 Emergency services – Technical protection response and assistance

Description of the activity

Technical protection and assistance activities in response to emergencies, such as:

- Flood containment by reinforcing existing structures and building new barriers to prevent further flooding of rivers, basins, waterways with rising water levels, when implemented during and in the immediate aftermath of a flood emergency

Note: Delineation with activity "Civil infrastructure for flood protection" will likely need to be established

- High capacity pumping (e.g., in flooded areas)
- Water purification, storage and delivery via mobile water purification and storage units
- Transport of emergency response personnel and supplies
- Setting up, maintenance and operation of emergency communication systems *Note: Further delineation with activity "ICT" will likely need to be established*
- Setting up, maintenance and operation of emergency power generation systems

The activity scope includes preparedness activities directly related to technical protection and assistance and may include but is not limited to: development and update of emergency technical protection and assistance plans; training and capacity building of emergency technical protection and assistance staff, service animals or volunteers; construction and maintenance of training facilities used for training to respond to climate change-attributable hazards; stockpiling and storage of materials and equipment necessary for emergency technical protection and assistance; construction, purchasing, upgrading and maintenance of infrastructure and equipment necessary for emergency technical protection and assistance; related educational and awareness-raising activities carried out by the emergency technical protection and assistance providers in the community and/or targeted at selected stakeholders/target groups.

The scope excludes any of the above activities if they exclusively address technical protection and assistance in relation to emergencies that cannot be attributed to current and future projected climatic factors.

The activity scope may include, but is not limited to NACE code(s):

84.25 Fire service activities

- … assistance in civic disasters, floods, road accidents etc…

Substantial contribution to climate change adaptation

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1. The economic activity has implemented physical and non-physical solutions ('adaptation solutions') that substantially reduce the most important physical climate risks that are material to that activity.

2.The physical climate risks that are material to the activity have been identified from those listed in Appendix A to Annex II of the Delegated Act[530] by performing a robust climate risk and vulnerability assessment with the following steps:

(a) screening of the activity to identify which physical climate risks from the list in Appendix A to Annex II of the Delegated Act may affect the performance of the economic activity during its expected lifetime;

(b) where the activity is assessed to be at risk from one or more of the physical climate risks listed in Appendix A to Annex II of the Delegated Act, a climate risk and vulnerability assessment to assess the materiality of the physical climate risks on the economic activity;

(c) an assessment of adaptation solutions that can reduce the identified physical climate risk.

The climate risk and vulnerability assessment is proportionate to the scale of the activity and its expected lifespan, such that:

(a) for activities with an expected lifespan of less than 10 years, the assessment is performed, at least by using climate projections at the smallest appropriate scale;

(b) for all other activities, the assessment is performed using the highest available resolution, state of-the-art climate projections across the existing range of future scenarios[531] consistent with the expected lifetime of the activity, including, at least, 10 to 30 years climate projections scenarios for major investments.

[530] COMMISSION DELEGATED REGULATION (EU) …/... supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council by establishing the technical screening criteria for determining the conditions under which an economic activity qualifies as contributing substantially to climate change mitigation or climate change adaptation and for determining whether that economic activity causes no significant harm to any of the other environmental objectives-C/2021/2800 final

[531] Future scenarios include Intergovernmental Panel on Climate Change representative concentration pathways RCP2.6, RCP4.5, RCP6.0 and RCP8.5.

3. The climate projections and assessment of impacts are based on best practice and available guidance and take into account the state-of-the-art science for vulnerability and risk analysis and related methodologies in line with the most recent Intergovernmental Panel on Climate Change reports[532], scientific peer-reviewed publications and open source[533] or paying models.

4.The adaptation solutions implemented:

(a) do not adversely affect the adaptation efforts or the level of resilience to physical climate risks of other people, of nature, of cultural heritage, of assets and of other economic activities;

(b) favour nature-based solutions[534] or rely on blue or green infrastructure[535] to the extent possible;

(c) are consistent with local, sectoral, regional or national adaptation plans and strategies;

(d) are monitored and measured against pre-defined indicators and remedial action is considered where those indicators are not met;

(e) where the solution implemented is physical and consists in an activity for which technical screening criteria have been specified in this Annex, the solution complies with the do no significant harm technical screening criteria for that activity.

5. In order for an activity to be considered as an enabling activity as referred to in Article 11(1), point (b), of Regulation (EU) 2020/852, the economic operator demonstrates, through an assessment of current and future climate risks, including uncertainty and based on robust data,

[532] Assessments Reports on Climate Change: Impacts, Adaptation and Vulnerability, published periodically by the Intergovernmental Panel on Climate Change (IPCC), the United Nations body for assessing the science related to climate change produces, https://www.ipcc.ch/reports/.

[533] Such as Copernicus services managed by the European Commission.

[534] Nature-based solutions are defined as 'solutions that are inspired and supported by nature, which are cost-effective, simultaneously provide environmental, social and economic benefits and help build resilience. Such solutions bring more, and more diverse, nature and natural features and processes into cities, landscapes and seascapes, through locally adapted, resource-efficient and systemic interventions'. Therefore, nature-based solutions benefit biodiversity and support the delivery of a range of ecosystem services (version of [adoption date]: https://ec.europa.eu/info/research-and-innovation/research-area/environment/nature-based-solutions_en/).

[535] See Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Green Infrastructure (GI) — Enhancing Europe's Natural Capital (COM/2013/0249 final).

, that the activity provides a technology, product, service, information, or practice, or promotes their uses with one of the following primary objectives:

(a) increasing the level of resilience to physical climate risks of other people, of nature, of cultural heritage, of assets and of other economic activities;

(b) contributing to adaptation efforts of other people, of nature, of cultural heritage, of assets and of other economic activities.

Do no significant harm ('DNSH')

(1) Climate change mitigation	1.The operator this activity has developed and implemented Climate Change Mitigation and Environmental Protection Plan following these steps: (a) Identification of key harmful climate and environmental impacts of their assets and operations, as a minimum for climate change mitigation including impacts in these categories: i) Scope 1 GHG emissions (direct GHG emissions occurring from sources that are owned or controlled by the operator including GHG emissions of land, water and air transport and equipment (such as emergency energy generators) used for technical protection response operations) and ii) Scope 2 GHG emissions (GHG emissions from the generation of the electricity consumed by the operator); (b) Definition of the necessary measures to minimize the identified harmful impacts of the activity on climate and the environment in balance with the successful achievement of the main purpose of the emergency service. The plan is to explain the level of improvement achievable with the implementation of the proposed measures and include a time plan for the implementation of the full range of the identified measures; (c) Monitoring and documentation of the implementation of the identified measures in accordance with the time plan as well as

	monitoring and documentation of the level of improvements achieved. 2. The Climate Change Mitigation and Environmental Protection Plans: (a) Are based on best available scientific or equally rigorous other evidence, which is transparently reported; (b) To the extent applicable, employ the techniques included in the reference documents for the Best Available Techniques (BAT) – so-called BREF(s))[536] related to Article 13(1) of the Industrial Emissions Directive (IED, 2010/75/EU)[537] – or other techniques that demonstrably provide for an equivalent or higher level of environmental protection – to ensure emissions to air, water and soil are prevented / minimized; (c) Are developed in consultation with relevant stakeholders, including but not limited to environmental protection authorities; (d) Are updated if and when the characteristics and modus operandi of the activity change significantly, potentially altering the nature and/or scale of impacts on climate and the environment.
(3) Sustainable use and protection of water and marine resources	1.The operator this activity has developed and implemented Climate Change Mitigation and Environmental Protection Plan following these steps: (a) Identification of key harmful climate and environmental impacts of their assets and operations, as a minimum for the objective of protecting water and marine resources including impacts in these categories: i) impacts on water and marine resources, including on the areas included in the Water Framework Directive registers of protected

[536] https://eippcb.jrc.ec.europa.eu/reference/

[537] https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1579186952334&uri=CELEX:32010L0075

areas (Article 6, Directive 2000/60/EC or other equivalent national or international classifications/definitions);

(b) Definition of the necessary measures to minimize the identified harmful impacts of the activity on climate and the environment in balance with the successful achievement of the main purpose of the emergency service. The plan is to explain the level of improvement achievable with the implementation of the proposed measures and include a time plan for the implementation of the full range of the identified measures;

(c) Monitoring and documentation of the implementation of the identified measures in accordance with the time plan as well as monitoring and documentation of the level of improvements achieved.

2. The Climate Change Mitigation and Environmental Protection Plans:

(a) Are based on best available scientific or equally rigorous other evidence, which is transparently reported;

(b) To the extent applicable, employ the techniques included in the reference documents for the Best Available Techniques (BAT) – so-called BREF(s))[538] related to Article 13(1) of the Industrial Emissions Directive (IED, 2010/75/EU)[539] – or other techniques that demonstrably provide for an equivalent or higher level of environmental protection – to ensure emissions to air, water and soil are prevented / minimized;

(c) Are developed in consultation with relevant stakeholders, including but not limited to environmental protection authorities;

[538] https://eippcb.jrc.ec.europa.eu/reference/

[539] https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1579186952334&uri=CELEX:32010L0075

	(d) Are updated if and when the characteristics and modus operandi of the activity change significantly, potentially altering the nature and/or scale of impacts on climate and the environment.
(4) Transition to a circular economy	1.The operator this activity has developed and implemented Climate Change Mitigation and Environmental Protection Plan following these steps: (a) Identification of key harmful climate and environmental impacts of their assets and operations, as a minimum for transition to a circular economy objective including impacts in these categories: i) waste (as defined in the Commission Decision 2000/532/EC list of waste) generation, management, treatment; and ii) alignment with circular economy principles (reduction of landfilling, increased reuse and recycling of products, materials and resources). (b) Definition of the necessary measures to minimize the identified harmful impacts of the activity on climate and the environment in balance with the successful achievement of the main purpose of the emergency service. The plan is to explain the level of improvement achievable with the implementation of the proposed measures and include a time plan for the implementation of the full range of the identified measures; (c) Monitoring and documentation of the implementation of the identified measures in accordance with the time plan as well as monitoring and documentation of the level of improvements achieved. 2. The Climate Change Mitigation and Environmental Protection Plans: (a) Are based on best available scientific or equally rigorous other evidence, which is transparently reported;

	(b) To the extent applicable, employ the techniques included in the reference documents for the Best Available Techniques (BAT) – so-called BREF(s))[540] related to Article 13(1) of the Industrial Emissions Directive (IED, 2010/75/EU)[541] – or other techniques that demonstrably provide for an equivalent or higher level of environmental protection – to ensure emissions to air, water and soil are prevented / minimized; (c) Are developed in consultation with relevant stakeholders, including but not limited to environmental protection authorities; (d) Are updated if and when the characteristics and modus operandi of the activity change significantly, potentially altering the nature and/or scale of impacts on climate and the environment.
(5) Pollution prevention and control	1.The operator this activity has developed and implemented Climate Change Mitigation and Environmental Protection Plan following these steps: (a) Identification of key harmful climate and environmental impacts of their assets and operations, as a minimum for pollution prevention and control objective including impacts in these categories: i) polluting emissions to air, water or land as defined in Article 3(3) Directive 2010/75/EU; (b) Definition of the necessary measures to minimize the identified harmful impacts of the activity on climate and the environment in balance with the successful achievement of the main purpose of the emergency service. The plan is to explain the level of improvement achievable with the implementation of the

[540] https://eippcb.jrc.ec.europa.eu/reference/

[541] https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1579186952334&uri=CELEX:32010L0075

	proposed measures and include a time plan for the implementation of the full range of the identified measures; (c) Monitoring and documentation of the implementation of the identified measures in accordance with the time plan as well as monitoring and documentation of the level of improvements achieved. 2. The Climate Change Mitigation and Environmental Protection Plans: (a) Are based on best available scientific or equally rigorous other evidence, which is transparently reported; (b) To the extent applicable, employ the techniques included in the reference documents for the Best Available Techniques (BAT) – so-called BREF(s))[542] related to Article 13(1) of the Industrial Emissions Directive (IED, 2010/75/EU)[543] – or other techniques that demonstrably provide for an equivalent or higher level of environmental protection – to ensure emissions to air, water and soil are prevented / minimized; (c) Are developed in consultation with relevant stakeholders, including but not limited to environmental protection authorities; (d) Are updated if and when the characteristics and modus operandi of the activity change significantly, potentially altering the nature and/or scale of impacts on climate and the environment.
(6) Protection and restoration of biodiversity and ecosystems	1.The operator this activity has developed and implemented Climate Change Mitigation and Environmental Protection Plan following these steps: (a) Identification of key harmful climate and environmental impacts of their assets and operations, as a minimum for the protection and restoration of biodiversity and ecosystems objective including impacts in these categories:

[542] https://eippcb.jrc.ec.europa.eu/reference/

[543] https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1579186952334&uri=CELEX:32010L0075

	i) impacts on biodiversity and ecosystems, including on biodiversity-sensitive areas, such as Natura2000 areas (listed in the Natura 2000 Viewer) in accordance with the Habitats Directive (Article 3, Directive 92/43/EEC), Birds Directive (Article 4, Directive 2009/147/EC), and the Marine Strategy Framework Directive (Recital 6 and 7 and Article 21, Directive 2008/56/EC) (or other equivalent national or international classifications/definitions) during technical protection response operations or due to the failure to protect these sensitive areas from damage; (b) Definition of the necessary measures to minimize the identified harmful impacts of the activity on climate and the environment in balance with the successful achievement of the main purpose of the emergency service, including planned actions to minimize the risks to biodiversity-sensitive areas, for example, by integrating spatial information on biodiversity-sensitive areas and principles of care in technical protection response planning. The plan is to explain the level of improvement achievable with the implementation of the proposed measures and include a time plan for the implementation of the full range of the identified measures; (c) Monitoring and documentation of the implementation of the identified measures in accordance with the time plan as well as monitoring and documentation of the level of improvements achieved. 2. The Climate Change Mitigation and Environmental Protection Plans: (a) Are based on best available scientific or equally rigorous other evidence, which is transparently reported; (b) To the extent applicable, employ the techniques included in the reference documents for the Best Available Techniques (BAT) –

	so-called BREF(s))[544] related to Article 13(1) of the Industrial Emissions Directive (IED, 2010/75/EU)[545] – or other techniques that demonstrably provide for an equivalent or higher level of environmental protection – to ensure emissions to air, water and soil are prevented / minimized; (c) Are developed in consultation with relevant stakeholders, including but not limited to environmental protection authorities; (d) Are updated if and when the characteristics and modus operandi of the activity change significantly, potentially altering the nature and/or scale of impacts on climate and the environment.

Rationale

On scope

- The highest SC to adaptation would be delivered if all aspects of civil protection – prevention, preparedness, response and recovery - are included in the taxonomy, however that would require inclusion of a very high number of economic activities and would likely overlap with many other activities already included or are currently being developed. Taken that several prevention and preparedness related economic activities are being worked on separately, it is considered sensible for this activity to be focused on disaster/emergency response.
- "Disaster response" definition EU: "any action taken [..] in the event of an imminent disaster, or during or after a disaster, to address its immediate adverse consequences."[546]
- The activity scope is aligned with the classification of the EU Civil Protection Mechanism framework.

[544] https://eippcb.jrc.ec.europa.eu/reference/

[545] https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1579186952334&uri=CELEX:32010L0075

[546] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02013D1313-20210101

- Where this activity also includes prevention and preparedness related actions carried out by the same operator who provides the identified emergency response, those would also be included and accounted for in the scope of this activity – to avoid unnecessarily detailed compartmentalisation, meaning that the CapEx and OpEx and turnover related to these actions will be eligible to be reported as “taxonomy aligned”.
- The system boundary is necessary for the definition of the scope of the activity and its sub-activities to clearly delineate between in-scope activities and the related up-stream (and down-stream) processes. The following rules apply for setting the system boundary of Emergency Services:
    - The proposed activity system boundary is the service itself – all actions that are carried out as integral parts of the specific emergency service. This excludes upstream processes, such as all manufacturing and sales of goods and materials and machinery used in the implementation of these services (however, the service of, for example, stockpiling such goods would be seen as pertaining to the Emergency Services themselves and therefore within scope of this activity. Likewise excluded are supporting services, which themselves cannot be defined as one of the Emergency Services (these should be seen as activities that enable Emergency Services), e.g., the ICT services for setting up early warning systems.
    - The actions and expenditure, which are clearly dedicated to emergency response that is not related (attributable) to current or future expected climate and do not contribute to emergency services activities in response to emergencies related to current or future climatic conditions, are excluded from this activity.
    - In terms of geographic boundaries this activity includes emergency services that are carried out outside of Europe but are carried out by European actors.[547]
- The activity description should precede the NACE code in importance for setting the activity scope and delimitations as there is no overall alignment with NACE classification for these activities.

[547] Note to reviewers: more work needs to be done on how the scenario when foreign operators carry out emergency response activities in Europe might affect adaptation taxonomy and its application.

On Substantial Contribution criteria

- Emergency services for technical protection response and assistance as an economic activity are highly vulnerable to climate change impacts – that is, climate change impacts render emergency services for technical protection response and assistance unable to fulfil their core purpose as they are not equipped to deal with the scale, nature and frequency of emergencies in the changed climatic conditions, UNLESS the activity is itself adapted with a high priority. The high priority is due to both a) high direct vulnerability b) domino effects and significant increase of overall impacts across a territory if the activity is not adapted.
- Well-adapted emergency services for technical protection response and assistance increase the overall background resilience of an area and that leads to the overall background resilience of most economic activities carried out in the area. This can be interpreted as an “enabling” contribution, however the enabling impact is diffuse throughout the territory and is not “directly” targeted to enable specific identifiable other economic activities, the link in this case is indirect and diffuse.
- Based on the two points above, the activity is to be included in the taxonomy as both high priority “adapted” and “enabling” activity.
- The SC criteria for adaptation for activities that need to be regarded as both adapted and enabling in TEG recommendations and in the 1st Delegated Act follow process-based approach, which is likewise deemed to be the most suitable for emergency services for technical protection response and assistance activities.
- The resilience to climate change of Emergency Services for technical protection response and assistance is ensured by implementing adaptation solutions for identified climate change risks safeguarding the continued effective operation of Emergency Services for technical protection response and assistance activities in the current and future climatic conditions without serious preventable failures, including when responding to natural hazards and emergencies exacerbated by climate change impacts. The implemented measures ensure the ability of Emergency Services for technical protection response and assistance activities’ to contribute substantially to reducing or preventing the adverse impact of the current or expected future climate, or the risks of such adverse impact, on people, cultural heritage, nature, assets and other economic activities within the EU and internationally.

ON DNSH criteria

- The criteria for no significant harm to the climate and environmental objectives in the case of emergency services need to recognise and be balanced against the primary purposes of emergency services. It is seen to be outside of the remit of the Platform to make the best judgement on the appropriate balance between, on one hand - the goals of protecting and saving lives, health, assets and natural and cultural values- and on the other hand - the environmental protection and GHG emissions reductions. Nevertheless, for the emergency services activities to be recognised as Taxonomy aligned, environmental and climate considerations need to be integrated in emergency services planning, operations and coordination as part of DNSH approach.
- Due to the characteristics of immediacy and rapid decision-making during emergency response, the environmental and climate considerations need to be integrated starting from the early stages of emergency response planning, training of staff, defining response protocols as well as development of supporting systems and tools.
- Due to the considerations above, a self-assessment of climate and environmental impacts and early coordinated mitigating action planning and implementation involving environmental protection authorities and stakeholders via process based DNSH criteria is considered the most appropriate approach.
- To ensure that the required impact identification and action planning by emergency services operators addresses all other taxonomy objectives as relevant to the activity and has sufficient scope, the minimum list of impact areas to be considered is listed.
- Further important requirements are the analysis and transparent reporting on the level of improvement achievable by the planned actions, setting up of monitoring framework and reporting on action implementation and improvements achieved, and minimum quality and governance requirements.
- To ensure that specific potentially significant environmental impacts as identified per emergency service activity are included in the mandated plans, specific per-activity scope requirements are included

7.8 Flood risk prevention and protection infrastructure for inland river and coastal floods

Description of the activity

The activity refers to structural (civil engineering structures) and non-structural (not involving civil engineering structures) measures aiming at prevention and protection of people, ecosystems and infrastructure against river floods and floods from the seas in the coastal areas in the context of the floods directive. Measures undertaken are inter alia (not an exhaustive list):

Structural for flood protection: Dykes, river embankments; Sea defense dykes, storm-surge barriers, seawalls, groynes and breakwaters; Water retention (off-line) reservoirs for flood control purposes; Upper watershed source control; Hydraulic structures to regulate water flow such as pumping stations, sluices, gates etc; Sediment control structures along rivers, or in deltas.

Non- Structural for flood prevention and preparedness: Flood awareness raising campaigns; Flood modelling and forecasting, flood hazard and risk mapping; Regulations that take into account flood risk in spatial planning (where to build) and in building codes (how to build) in flood-prone areas; Flood early warning systems.

It includes construction (new), extension, rehabilitation, upgrade and operation of the activity.

The activity covers only part of NACE code F42.91 “Construction of water projects” in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006. The activities that have not been included here are listed below and they are covered by other respective separate templates:

- NbS for flood protection as the activity is covered by a separate template under the same NACE code F42.91.
- Infrastructure for water transport such as ports, marinas and dredging waterways given that the primary purpose of these activities is navigation and water transport and not flood protection. The activity is covered by a separate template and classified under NACE code F42.91, F71.1 or F71.20 in accordance with section 6.16 in the first Delegated Act.
- Urban stormwater management structures as the activity is covered under the Urban Wastewater Treatment template with the NACE code E37- Sewerage

- Sustainable Urban Drainage Systems (SUDs) as the activity is covered with a separate template under NACE code E37- Sewerage.
- Emergency response and recovery plans in case of a flood event as this activity falls under the civil protection area and it is covered under the “Emergency Services” template partly under NACE codes 84.25, 02.40, 80.20, 52.23, 86.10, 86.90, 84.22, 39.00, 88.99
- Construction, modification or removal of on-line water retaining structures (ie large dams) which result in impoundment (artificial reservoirs) primarily for the purposes of hydropower use and /or irrigation

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Substantial contribution to climate change adaptation

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1. The economic activity has implemented physical and non-physical solutions (‘adaptation solutions’) that substantially reduce the most important physical climate risks that are material to that activity.

2 The physical climate risks that are material to the activity have been identified from those listed in Appendix A to Annex II of the first Delegated Act supplementing Regulation (EU) 2020/852 by performing a robust climate risk and vulnerability assessment with the following steps:

(a) screening of the activity to identify which physical climate risks from the list in Appendix A to Annex II of the Delegated Act may affect the performance of the economic activity during its expected lifetime;

(b) where the activity is assessed to be at risk from one or more of the physical climate risks listed in Appendix A to Annex II of the Delegated Act, a climate risk and vulnerability assessment to assess the materiality of the physical climate risks on the economic activity;

(c) an assessment of adaptation solutions that can reduce the identified physical climate risk.

The climate risk and vulnerability assessment is proportionate to the scale of the activity and its expected lifespan, such that:

(a) for activities with an expected lifespan of less than 10 years, the assessment is performed, at least by using climate projections at the smallest appropriate scale;

(b) for all other activities, the assessment is performed using the highest available resolution, state of-the-art climate projections across the existing range of future scenarios[548] consistent with the expected lifetime of the activity, including, at least, 10 to 30 years climate projections scenarios for major investments.

3. The climate projections and assessment of impacts are based on best practice and available guidance and take into account the state-of-the-art science for vulnerability and risk analysis and related methodologies in line with the most recent Intergovernmental Panel on Climate Change reports[549], scientific peer-reviewed publications and open source[550] or paying models.

4.The adaptation solutions implemented:

(a) do not adversely affect the adaptation efforts or the level of resilience to physical climate risks of other people, of nature, of cultural heritage, of assets and of other economic activities;

(b) favour nature-based solutions[551] or rely on blue or green infrastructure[552] to the extent possible;

(c) are consistent with local, sectoral, regional or national adaptation plans and strategies;

(d) are monitored and measured against pre-defined indicators and remedial action is considered where those indicators are not met;

[548] Future scenarios include Intergovernmental Panel on Climate Change representative concentration pathways RCP2.6, RCP4.5, RCP6.0 and RCP8.5.

[549] Assessments Reports on Climate Change: Impacts, Adaptation and Vulnerability, published periodically by the Intergovernmental Panel on Climate Change (IPCC), the United Nations body for assessing the science related to climate change produces, https://www.ipcc.ch/reports/.

[550] Such as Copernicus services managed by the European Commission.

[551] Nature-based solutions are defined as 'solutions that are inspired and supported by nature, which are cost-effective, simultaneously provide environmental, social and economic benefits and help build resilience. Such solutions bring more, and more diverse, nature and natural features and processes into cities, landscapes and seascapes, through locally adapted, resource-efficient and systemic interventions'. Therefore, nature-based solutions benefit biodiversity and support the delivery of a range of ecosystem services (version of [adoption date]: https://ec.europa.eu/info/research-and-innovation/research-area/environment/nature-based-solutions_en/).

[552] See Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Green Infrastructure (GI) — Enhancing Europe's Natural Capital (COM/2013/0249 final).

(e) where the solution implemented is physical and consists in an activity for which technical screening criteria have been specified in this Annex, the solution complies with the do no significant harm technical screening criteria for that activity.

5. In order for an activity to be considered as an enabling activity as referred to in Article 11(1), point (b), of Regulation (EU) 2020/852, the economic operator demonstrates, through an assessment of current and future climate risks, including uncertainty and based on robust data, that the activity provides a technology, product, service, information, or practice, or promotes their uses with one of the following primary objectives:

(a) increasing the level of resilience to physical climate risks of other people, of nature, of cultural heritage, of assets and of other economic activities;

(b) contributing to adaptation efforts of other people, of nature, of cultural heritage, of assets and of other economic activities.

Do no significant harm ('DNSH')

(1) Climate change mitigation	N/A
(3) Sustainable use and protection of water and marine resources	DNSH as set out in Appending B of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852. Where relevant, environmental degradation risks related to preserving marine environment are identified and addressed with the aim of achieving good environmental status as defined in point 5 of Article 3 of Directive 2008/56/EC.
(4) Transition to a circular economy	Measures are put in place to prevent and manage construction and demolition waste in accordance with the waste hierarchy and in line with

	good industry practice, as defined, for instance, in the EU Construction and Demolition Waste Protocol[553]
(5) Pollution prevention and control	N/A
(6) Protection and restoration of biodiversity and ecosystems	The activity: 1. Complies with the requirements under the SEA and the EIA Directives 2. Complies with Articles 16 and 6.3 and 6.4 of the Habitats Directive and Article 3 and 4 of the Birds Directive, Article 4 of the Water Framework Directive, the Marine Strategy Framework Directive 2008/56/EC, the Invasive Alien Species Regulation (Regulation (EU) No 1143/2014) and the respective national environmental law. 3. It is consistent with national, regional or local flood risk management strategies and plans at river basin scale. In Addition: In areas designated by the national competent authority for conservation or in habitats that are protected, the activity is in accordance with the conservation objectives for those areas. There is no conversion of habitats specifically sensitive to biodiversity loss or with high conservation value, or of areas set aside for the restoration of such habitats in accordance with national law.
Rationale	

[553] EU Construction and Demolition Waste Protocol and Guidelines | Internal Market, Industry, Entrepreneurship and SMEs (europa.eu)

Climate change is an aggravating factor, triggering changes in precipitation and weather patterns, sea level rises and, consequently, more frequent and severe floods. Fluvial flooding is one of the costliest natural disasters in Europe. If no mitigation and adaptation measures are taken, economic losses will increase to nearly €50 billion/year with 3°C global warming by the end of this century, or more than six times compared to the present day[554].

Furthermore, approximately one third of the EU population lives within 50km of the coast and these areas generate over 30% of the EU's total GDP. In the absence of further investments in coastal adaptation, the present expected annual damage (EAD) of €1.25 billion is projected to increase by two to three orders of magnitude by the end of the century, ranging between 93 and €961 billion.[555]

The European Commission launched a new EU strategy on adaptation to climate change in early 2021[556]. The long-term vision is that in 2050, the EU will be a climate-resilient society, fully adapted to the unavoidable impacts of climate change. Smart, sustainable water use requires transformational changes in all sectors. The Commission will prioritise this through the enhanced engagement of the Common Implementation Strategy of the Water Framework and Floods Directives. Nature-based solutions are particularly well suited for climate resilience to water impacts[557].

In response to the rising incidence of flooding, the EU adopted in 2007 the Floods Directive. This Directive establishes a legal framework for the assessment and management of flood risks across Member States, aiming at reducing the adverse consequences of floods to the human health, the environment, cultural heritage and economic activity. The Directive requires Member States to produce flood risk management plans (FRMPs) in those areas for which potential significant flood risk has been assessed. Furthermore, climate change is explicitly

[554] Feyen, L., Ciscar, J.C., Gosling, S., Ibarreta, D. and Soria, A. (editors) (2020). Climate change impacts and adaptation in Europe. JRC PESETA IV final report. EUR 30180EN, Publications Office of the European Union, Luxembourg, ISBN 978-92-76-18123-1, doi:10.2760/171121, JRC119178

[555] Vousdoukas M., Mentaschi L., Voukouvalas E., Bianchi A., Dottori F. & Feyen L. (2018). Climatic and socioeconomic controls of future coastal flood risk in Europe. Nature Climate Change volume 8, pages776–780.

[556] COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS Forging a climate-resilient Europe - the new EU Strategy on Adaptation to Climate Change COM/2021/82 final

[557] Technical Screening Criteria and DNSH for the activity of NbS for flood protection for the Water Objective have been developed under a separate template

included in the Directive, and Member States are clearly expected to take into account in the design of a flood related measure the likely impacts of climate change on the occurrence of floods.

A flood related measure should be part of or suitable for inclusion in a FRMP developed under the Floods Directive that coordinates the planned action at river basin level, involves public consultation and can be seen as a reference document for quantifying how significant the measure may be and for determining levels of acceptable risk.

This should guarantee that the measure has been developed taking into account the wider context, on the basis of a process based approach that is explicitly outlined in the Floods Directive and further explained in the relevant CIS guidance documents[558]. The approach requires the following three steps to be applied: 1) identification of the Areas of Potentially Significant Flood Risk (APSFR), and within the APSFR, 2) production of Flood Hazard and Risk maps and 3) development of a FRMP.

A review carried out by the Centre of Ecology and Hydrology (CEH)[559] in 2013 looked at how MSs incorporate climate change in estimating extreme flood flows and precipitations. This report stated that: "*The review of existing guidelines in Europe on design floods and design rainfalls shows that only few countries explicitly address climate change. These design guidelines are based on climate change adjustment factors to be applied to current design estimates and may depend on design return period and projection horizon. The review indicates a gap between the need for considering climate change impacts in design and actual published guidelines that incorporate climate change in extreme precipitation and flood frequency*".

Although CEH's report was produced early in the implementation of the first cycle of the Floods Directive its conclusions remain relevant. During the European Court of Auditor's (ECA) audit

[558] Further guidance may be obtained from CIS documents, https://ec.europa.eu/environment/water/water-framework/facts_figures/guidance_docs_en.htm and reporting documentation, http://cdr.eionet.europa.eu/help/Floods/Floods_2018/index.html

[559] Centre for Ecology and Hydrology (CEH) (2013) A review of applied methods in Europe for flood frequency in a changing climate, WG4: Flood frequency analysis and environmental change, ISBN: 978-1-906698-36-2

in 2018 of MSs' FRMPs[560] for the first cycle of the Floods Directive, the audited MSs emphasised their challenges in relation to quantifying flood risk under future climate change, considering the large uncertainties present in the current climate change modelling frameworks. These large uncertainties were a factor which led to some MSs choosing either not to include climate change impacts in their first FRMPs, or to do so only in a very limited manner.

Nevertheless, quantifying flood risk under future climate change is a key requirement for the implementation of the second cycle of the Floods Directive and Member States are clearly expected to take into account either in the rehabilitation of an existing flood protection infrastructure, or the planning of a flood prevention measure the likely impacts of climate change on the occurrence of floods. The activity makes, to the extent possible, appropriate use of EU knowledge platforms such as the Climate-ADAPT[561] and climate modelling tools such as those available through the Copernicus Climate Change Service[562] so as to better integrate climate change into the engineering design and flood risk management options.

On 4 to 5 November 2020 a conference entitled "Climate change and the European water dimension: Enhancing resilience" was organised by the Trio Council Presidencies (Germany, Portugal and Slovenia) and hosted by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety. One of the main findings of the conference was that MSs should "*increase consideration of climate change in flood risk management planning"* and at the same time they need to "*acknowledge the limits of incremental adaptation in flood risk management and better coordinate flood risk management with spatial planning*".

Furthermore, it was felt that the cyclical implementation process of the Floods Directive provides a starting point for, where relevant, an adaptive approach which allows for adjusting

[560] European Court of Auditors (ECA) (2018) Special report no 25/2018: Floods Directive: progress in assessing risks, while planning and implementation need to improve, 20 November, available at: https://www.eca.europa.eu/en/Pages/DocItem.aspx?did=47211 last accessed: 29 January 2021

engineering solutions to changing climate conditions based on a continuous iterative process of review and learning new information.

- DNSH Mitigation: It is considered as not substantial to the activity. On the basis of lifecycle considerations, the flood protection activity focuses on the operational phase rather than the phase of construction given the very long economic life (30 years or more) of such structures. A flood protection activity may involve operating sluices/gates/pumps (energy intensive components) but this occurs typically only during a flood event and not under normal operational conditions. Therefore, its impact to mitigation is considered low during operation. However, even if the GHG emissions produced during the construction phase are considered, given that they are distributed pro-rata over the very long economic life of the activity (30 years or more), the impact of the activity is again considered not to cause any significant harm to the concept of CC Mitigation.

- DNSH Circular Economy: DNSH criteria are introduced to prevent and manage construction and demolition waste (CDW) in accordance with the waste hierarchy and in line with good industry practice, although the criteria refer to the construction phase that represents only a very short part of the activity's very long economic life ie 30 years or more. However, quantitative thresholds such recovery targets for CDW are not introduced here since the common types of construction material for a large scale flood protection schemes such as gravel, sand are naturally occurring material which is not considered as non-hazardous construction and demolition waste and it is excluded from the European List of Waste established by Decision 2000/532/EC.

- DNSH Pollution Prevention. It is considered as not substantial to the activity. The activity may contribute positively to this objective as, in some cases, it prevents surface and ground water pollution, soil and sediment contamination, and intrusion of salt water into agricultural land that could result from a flood event. Nevertheless, any possible harmful effects of pollution are covered by the mitigation measures included under the DNSH for the objectives "protection for water and marine resources" and "protection of biodiversity and ecosystems". The generic DNSH criteria set out in Appendix C of the first Delegated Act are not adopted here as they are not considered as relevant to the activity.

- DNSH Biodiversity and ecosystem services: EIA Directive is not used due to the following reasons:

    - It does not necessarily capture the landscape (ecosystem) based scale. This can be achieved via compliance with the SEA directive. WFD also applies the river basin scale which is a more integrated approach.

    - It does not apply to all size projects whereas the Habitats and Birds Directives do.

    - It does not include guidelines applicable to the marine ecosystems whereas the Marine Strategy Directive (2008/56/EC) at the moment does

7.9 Nature based solutions (Nbs) for flood risk prevention and protection for both inland and coastal waters

Description of the activity

The activity refers to natural flood management measures that may have a key role to play in protecting against river and coastal flooding and at the same time enhancing the good status of water bodies and producing co-benefits to ecosystems and biodiversity.

NbS to reduce flood risks are split into two categories:

- **Small scale,** these represent green and blue solutions applied in an urban setting, such as green roofs, swales, permeable surfaces and infiltration basins, for urban storm water management purposes (not covered here).

- **Large-scale,** these are applied in rural and coastal areas, coordinated at river basin and/or regional/landscape scale and they are inter alia:

River measures (not an exhaustive list):

- Floodplain restoration including re-connection of a river with its floodplain or off-channel/lateral connectivity improvement

- Riparian/floodplain vegetation development

- Re-meandering river course

- Restoration of the longitudinal connectivity of a river by removing of small-scale dams and weirs along the river
- River restoration including elimination of artificial riverbank protection and/or natural bank stabilization
- Improvement of river depth and width variation to increase habitat diversity
- Riverbed re-naturalization such as removal of bed fixation/armoring, improvement/development of key habitats cover
- Wetlands restoration which can store flood water and help “slow the flow” of flood waters
- Improved sediment transport/dynamics, restore lateral erosion processes along a river

Coastal measures (not an exhaustive list):

- Conservation/restoration of coastal wetlands (mangrove forests, seagrass beds) which operate as a natural barrier
- Beach nourishment (for instance replenishment with natural materials using natural forces such as wind, waves, currents etc.)
- Dune reinforcement and restoration such as planting dune vegetation
- Coastal reef conservation/restoration
- Improvement of sediment management along a coast for coastal managed realignment

It includes construction (new), extension, and operation of the activity.

The activity covers only part of NACE code F42.91 “Construction of water projects” in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006. Sustainable Urban Drainage Systems (SUDs) are excluded here as they are covered under NACE code E37- Sewerage.

Substantial contribution to sustainable use and protection for water and marine resources

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The activity is eligible to substantially contribute only if it meets the following three criteria:

1. The activity is a quantifiable and/or time bound measure to achieve the objectives for flood risk reduction in accordance with a Flood Risk Management Plan (FRMP) coordinated at river basin scale and developed under the Floods Directive. For countries outside the EU the activity is identified as a flood risk reduction measure either in an Integrated Water Resources Management (IWRM) plan at river basin scale or in an Integrated Coastal Zone Management (ICZM) plan along a coast. These plans pursue the objectives for the management of flood risks to reduce adverse consequences where applicable for human health, the environment, cultural heritage and economic activity.

2. The activity demonstrates specific ecosystem co-benefits which contribute to achieving good water status in accordance with WFD[563] and nature restoration targets defined in the EU 2030 Biodiversity Strategy (which will be further refined under the proposal on the EU nature restoration regulation[564] expected by the end of 2021). Each Member State develops ecosystem action plan with clear and binding targets and timelines and definition of criteria either on restoration or conservation which is operationalized at regional or local level. The involvement of local stakeholders from the outset in the planning and design phases is required to ensure the full delivery of multiple benefits and the successful implementation of the activity. The restoration action plan is based on the principles outlined by IUCN Global Standard for NbS[565]. For countries outside EU, National Biodiversity Strategies and Action Plans[566] are the equivalent reference documents for developing ecosystem restoration action plans.

3. A monitoring programme is in place to evaluate the effectiveness of an NbS scheme to improving the status of the affected water body and changing climate conditions

[563] In accordance with the WFD (2000/60/EC) 'Good surface water status' means the status achieved by a surface water body when both its ecological status and its chemical status are at least 'good' and 'Good groundwater status' means the status achieved by a groundwater body when both its quantitative status and its chemical status are at least 'good'.

[564] Protecting biodiversity: nature restoration targets under EU biodiversity strategy (europa.eu) Inception impact assessment of restoration regulation proposal

[565] IUCN Global Standard for NbS | IUCN

[566] National Biodiversity Strategies and Action Plans (NBSAPs) (cbd.int)

	allowing for flexibility meaning the adaptive management approach. The programme is required to be periodically reviewed by an ad-hoc committee composed of sector experts (including ecologists) and the relevant regional or local managing authorities following the cyclical approach of the River Basin Management Plans and the Flood Risk Management Plans. For countries outside EU where there are no RBMPs or FRMPs equivalent documents in place, the programme is periodically reviewed at intervals not exceeding 10 years. The programme adheres to and aligns with the prevailing legal and regulatory provisions, being clear on where legal responsibilities and liabilities lie. The programme actively engages local communities and other affected stakeholders.

Do no significant harm ('DNSH')

(1) Climate change mitigation	N/A
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.
(4) Transition to a circular economy	N/A
(5) Pollution prevention and control	The use of pesticides is minimised and alternative approaches or techniques, which may include non-chemical alternatives to pesticides are favoured, in accordance with Directive 2009/128/EC, with exception of occasions where the use of pesticides is needed to control outbreaks of pest and diseases. The activity minimises the use of fertilisers and does not use manure.
(6) Protection and restoration of	The activity:

biodiversity and ecosystems	1. Complies with the requirements under the SEA and the EIA Directives 2. Complies with Articles 16 and 6.3 and 6.4 of the Habitats Directive and Article 3 and 4 of the Birds Directive, Article 4 of the Water Framework Directive, the Marine Strategy Framework Directive 2008/56/EC, the Invasive Alien Species Regulation (Regulation (EU) No 1143/2014) and the respective national environmental law. 3. It is consistent with national, regional or local flood risk management strategies and plans at river basin scale. In Addition: In areas designated by the national competent authority for conservation or in habitats that are protected, the activity is in accordance with the conservation objectives for those areas. There is no conversion of habitats specifically sensitive to biodiversity loss or with high conservation value, or of areas set aside for the restoration of such habitats in accordance with national law. The Restoration Action Plan required under the TSC criteria section includes provisions for maintaining and possibly enhancing biodiversity in accordance with national and local provisions, including the following: (a) ensuring the good conservation status of habitat and species, maintenance of typical habitat species, (b) exclude the use or release of invasive species.

Rationale

The European Commission defines Nature-based Solutions (NbS) as ‘solutions that are inspired and supported by nature, which are cost-effective, simultaneously provide environmental, social and economic benefits and help build resilience. Such solutions bring more, and more diverse, nature and natural features and processes into cities, landscapes and

seascapes, through locally adapted, resource-efficient and systemic interventions. Therefore, nature-based solutions must benefit biodiversity and support the delivery of a range of ecosystem services'[567].The NbS concept is grounded in the ecosystem approach: the knowledge that healthy natural and managed ecosystems produce a diverse range of regulating services including controlling floods, water purification, stabilizing shorelines and slopes.

In 2016, the EEA published a report on "Flood risks and environmental vulnerability - Exploring the synergies between floodplain restoration, water policies and thematic policies"[568]. The report focused on the role of floodplains in flood protection, water management, nature protection or agriculture and the impact of hydro-morphological alterations on the ecosystem services that floodplains provide. In 2018, the EEA released a briefing on the importance of floodplains and why natural condition of flood plains are an important ecological part of a river system[569].

In May 2021, the EEA released a report on "Nature-based solutions in Europe: Knowledge base on nature-based solutions for climate change adaptation and disaster risk reduction"[570]. This report shows that NbS are increasingly integrated in the global and EU policy frameworks that are relevant for protecting and enhancing the status of aquatic ecosystems and resilience to climate change. The report also confirms that the effectiveness of NbS is highly dependent on the local context. Involving local stakeholders from the outset in the planning and design phases is crucial for ensuring social acceptance and ultimately for the full delivery of multiple benefits. The report identifies two categories of NbS approaches for water management, the large-scale and the small-scale ones whereby the large-scale ones require integrated planning strategies and strong collaboration between different actors (e.g. water basin authorities across provinces, regions or countries).

[567] https://ec.europa.eu/info/research-and-innovation/research-area/environment/nature-based-solutions_en/

[568] https://www.eea.europa.eu/publications/flood-risks-and-environmental-vulnerability

[569] EEA 2018: why should we care about floodplains?: Briefing No 14/2018

[570] Nature-based solutions in Europe: Policy, knowledge and practice for climate change adaptation and disaster risk reduction — European Environment Agency (europa.eu)

Across Europe, enhancing floodwater retention areas of rivers is a solution that can reduce economic damage and the exposure of the population to flooding by up to 70 % while enhancing ecosystem quality, with a cost-benefit ratio superior to that of built infrastructure for flood mitigation[571]. The substantial contribution of the activity to both sub-objectives under the Water Objective ie mitigating the impacts of floods and protecting and enhancing the status of aquatic ecosystems, is complementary and not competitive. Where possible, the ultimate goal is to achieve a balance between protecting the conservation value of a water body and maintaining or improving the level of flood protection.

EU Floods Directive recognizes the value of NbS for use within natural, rural and urban areas to mitigate catchment flood risk, not least as a potential approach to water retention that can be used in a Flood Risk Management Plan (FRMP). An NbS flood related measure should be part of or suitable for inclusion in a FRMP developed under the Floods Directive that coordinates the planned action at river basin level, involves public consultation and can be seen as a reference document for quantifying how significant the measure may be and for determining levels of acceptable risk. This should guarantee that the measure has been developed taking into account the wider context of integrated management at river basin scale or integrated coastal zone management along a coast.

NbS approach for flood protection is not a substitute for engineered solutions but rather complementary and works well in conjunction with engineered river/flood management approaches. However, while several public authorities at local and regional level have made use of this opportunity and implemented large scale NbS (e.g. relocating dykes, using floodplain forests) to cope with floods in a sustainable way, they still represent only a small percentage of authorities.

Even though protecting and enhancing the status of aquatic ecosystems is already partially required from the Member States in existing EU legislation in the Habitats Directive, the Water Framework Directive, the Floods Directive and the Marine Strategy Framework Directive, there are still a number of regulatory failures that hinder progress of implementing large-scale NbS to flood risks. There are not always clear or binding targets and timelines and no definition or criteria on restoration.

[571] Feyen, L., et al., eds., 2020, Climate change impacts and adaptation in Europe: JRC Peseta IV final report, Publications Office of the European Union, Luxembourg.

Moreover, quantitative targets on ecosystem benefits can be defined only in relation to a specific location, habitat type, species and restoration target. Therefore, further determination of the water status (ecological, chemical etc) applicable to all NbS schemes for flood protection cannot be defined under the TSC section neither can the link between restoration targets and achievement of good water status be generalised.

The new EU biodiversity strategy for 2030[572] includes an EU nature restoration plan among its objectives, which has the potential to strongly support the uptake of restorative nature-based solutions in Europe. However, the legal requirement for Member States to develop biodiversity restoration action plans is yet not in place and the relevant proposal for a restoration regulation at EU level is expected to be published at the end of 2021[573]. Furthermore, there is no requirement yet to comprehensively map, monitor, assess and achieve good status of ecosystems so they can deliver benefits such as water regulation, and disaster prevention and protection across the EU. The EU Mapping and Assessment of Ecosystems and their Services initiative has made methodological progress in this respect, but there are still significant data gaps.

Although considerable knowledge and evidence base have been gained through various EU research programmes and actions such as the Horizon 2020-funded research projects, there is however still a large knowledge gap between the research efforts and the implementation phase. Knowledge and experience in implementing large scale NBS and their hybrid combinations with grey infrastructure are limited for a range of topics such as performance characteristics, design standards and guidelines, long time scales until intended benefits develop, coupling between modelling technologies and real-time monitoring and operation systems, cost-effectiveness, financing mechanisms, governance, social acceptance, etc[574]. More information is needed on the synergies and trade-offs, which can arise when combining nature-based solutions to flood risk reduction with grey infrastructure. Monitoring Indicators would need to be standardised to allow for cross-site comparison of effectiveness of nature-based solutions.

[572] https://eur-lex.europa.eu/resource.html?uri=cellar:a3c806a6-9ab3-11ea-9d2d-01aa75ed71a1.0001.02/DOC_1&format=PDF

[573] Protecting biodiversity: nature restoration targets under EU biodiversity strategy (europa.eu)

[574] Nature-based solutions for flood mitigation and coastal resilience - Publications Office of the EU (europa.eu)

- DNSH to Circular Economy. It is considered as not relevant to the activity. On the contrary, in some cases, the activity may positively contribute to CE by enabling the reuse of improved water quality effluent (eg from constructed wetlands) and groundwater recharge.

- DNSH to Pollution Prevention. Although in some cases, the activity may contribute to Pollution Prevention by improving water quality through infiltration and other natural processes in created, maintained or restored ecosystems, DNSH criteria have been added to ensure that the use of pesticides and fertilisers (if needed) is minimised and is in accordance with the relevant Directives. However, the generic DNSH criteria set out in Appendix C of the 1st DA are not fully adopted here as they are not considered as relevant per se to the activity.

- DNSH to Biodiversity. It is considered as relevant to the activity. A risk of invasive alien species or the use of non-native species could reduce soil quality and degrade biodiversity. For example, a tree-planting project using just one non-native species could result in poor soil biodiversity, ultimately making it more costly or impossible to sustain a diverse forest in the future. Similarly, restoring a mangrove forest to reduce the risk of storm damage could be doomed from the start and result in adverse impacts on the local biodiversity and water resources if upstream and downstream processes are not considered (landscape/ecosystem scale). EIA Directive is not used due to the following reasons:

    - It does not necessarily capture the landscape (ecosystem) based scale. This can be achieved via compliance with the SEA directive. WFD also applies the river basin scale which is a more integrated approach.

    - It does not apply to all size projects whereas the Habitats and Birds Directives do.

    - It does not include guidelines applicable to the marine ecosystems whereas the Marine Strategy Directive (2008/56/EC) at the moment does

8. Transport

8.1 Sea and coastal freight water transport

Description of the activity

Purchase, financing, chartering (with or without crew) and operation of vessels designed and equipped for transport of freight or for the combined transport of freight and passengers on sea or coastal waters, whether scheduled or not. Purchase, financing, renting and operation of vessels required for port operations and auxiliary activities, such as tugboats, mooring vessels,pilot vessels, salvage vessels and ice-breakers.

The economic activities in this category could be associated with several NACE codes, in particular H50.2, H52.22 and N77.34 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

Where an economic activity in this category does not fulfil the substantial contribution criterion specified in point 1 (a) of the SC section, the activity is a transitional activity as referred to in Article 10(2) of Regulation (EU) 2020/852, provided it complies with the remaining technical screening criteria set out in this Section.

Substantial contribution to pollution prevention and control

The Activity complies with technical screening criteria for substantial contribution set out in points 1-4 at the stage of vessel manufacturing/commissioning and Operational criteria set out in point 5[575]:

1. The activity complies with one or more of the following criteria for air pollution:

a) Zero direct emissions vessels SOx, NOx, PM

[575] Fulfilling of the operational criteria will be evidenced via relevant policies and procedures by vessels operators, or via relevant contractual obligations on the vessels charters/ operators posed by vessel owners.

b) Until 31st December 2025[576] vessels compliant with the general requirements of MARPOL Annex VI plus the requirements for Emission Control Areas (ECA) for SOx[577], NOx and PM regardless of the area of operation and having zero direct emission technology at berth.

2) The activity complies with one or more of the following criteria for oil pollution

a) Until 31st of December 2025 Vessels are equipped with IBTS (Integrated Bilge Water Treatment System) meeting the requirements of regulation 14 of the MARPOL Annex I (15ppm) and with real-time discharge quality monitoring system. Proper systems are in place to eliminate stern tube/propeller shaft oil leakage

b) From 1st January 2026 vessels equipped with relevant bilge water treatment systems to achieve oil content of the effluent without dilution of less than 5parts per million. Proper systems are in place to eliminate stern tube/propeller shaft oil leakage

3) The activity complies with one or more of the following criteria for water pollution

a) Vessels that operate at less than 12 miles from shore commit to a zero discharge of any kind of wastewater (grey and black water). Vessels are equipped with wastewater retention tanks and sewage collection systems to be emptied during stopovers in ports' terminals.

b) Until 31st of December 2025 vessels that operate beyond 12 miles from shore are equipped with on board treatments' systems approved by the Administration in accordance with ANNEX 26 Resolution MEPC.159(55) (2006 REVISED GUIDELINES ON IMPLEMENTATION OF EFFLUENT STANDARDS AND PERFORMANCE TESTS

[576] The nature of the engine on board defines GHG and air pollutants, therefore it is assumed that Pollution SC will be reviewed on 3 yearly basis along with Climate Mitigation SC.

[577] SOx ECA criteria can be met through operating on fuel with less than 0.1% sulphur content. If this is the choice made by the asset owner/operator, then this becomes the operational criteria and it has to be covenanted in the financial and contractual agreements between financial institutions/asset owners/operators and reported ex post minimum annually along with other operational requirements under point 5.

FOR SEWAGE TREATMENT PLANTS). All waste waters to be treated and discharged only after treatment and only beyond 12 miles from the shore.

4) The activity complies with the following criteria for underwater noise pollution:

a) Vessels larger than 24 meters must implement IMO recommendations MEPC.1/Circ.833: Guidelines for the Reduction of Underwater Noise from Commercial Shipping to Address Adverse Impacts on Marine Life with proper detailed measures based on the three primary sources of underwater noise, namely on propellers, hull form, on-board machinery, and various operational and maintenance recommendations such as hull cleaning. As a result of application of the guidelines, the vessel should achieve underwater noise levels no higher than 171 – 3 log f(Hz) or 10 Hz – 1 000 Hz and 162 – 12 log f(kHz) for 1 kHz – 100 kHz value in quiet cruise conditions at speed of 11knots and measured in accordance with ISO 17208/2:2019 .

5) The activity complies with the following operational requirements , which are covenanted in the financial and contractual agreements between financial institutions/asset owners/operators and reported ex post minimum annually

a) all vessels will have a maximum average speed of 10 knots, with exception of containerships where maximum average speed will not exceed 12 knots.

b) ISO 14001 standard certification must be required to verify correct operation of abatement technologies on-board, compliance with relevant environmental policies and procedures as well as legal compliance .

c) The operator has established strict procedures and ensures regular maintenance and continuous training on operation , maintenance and verifications of Integrated Bilge Water Treatment and Monitoring System systems.

d) The operator commits to an overflow STP plan to ensure untreated or partially treated sewage is not directed into the bilge or ballast water systems.

e) The operator commits to Zero discharge in Marine Protected Areas regardless of the by-laws set in specific MPAs.

f) The operator has implemented a cargo-tracing system allowing to provide evidence in regards to type of cargo carried, cargo lost at sea and compliance with international legislation related to hazardous cargo and prohibition of wildlife and human trafficking.

6) Activity is not related to transportation of fossil fuels, hazardous waste that are intended for final disposal, nuclear waste, transport of products linked to deforestation (such as soy, timber, palm oil and beef).

Do no significant harm ('DNSH')

(1) Climate change mitigation	*This criterion is not in the scope of this call for feedback.*
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.
(3) Sustainable use and protection of water and marine resources	*This criterion is not in the scope of this call for feedback.*
(4) Transition to a Circular Economy	Measures are in place to manage waste, both in the use phase and in the end-of-life of the vessel, in accordance with the waste hierarchy. For battery-operated vessels, those measures include reuse and recycling of batteries and electronics, including critical raw materials therein. For activities with ships above 500 gross tonnage, the activity complies with the requirements of Regulation (EU) No 1257/2013 relating to the control and management of hazardous materials on board of ships and the requirements applicable for their recycling. In particular, measures are in place to ensure ships intended for scrappage are recycled in

	facilities included on the European List of ship recycling facilities as laid down in Commission Implementing Decision 2016/2323. The activity complies with Directive (EU) 2019/883 of the European Parliament and of the Council as regards the protection of the marine environment against the negative effects from discharges of waste from ships. The ship is operated in accordance with Annex V to the International Convention for the Prevention of Pollution from Ships of 2 November 1973 (the IMO MARPOL Convention) and ANNEX 21 Resolution MEPC.295(71) (Adopted On 7 July 2017) 2017 Guidelines for the implementation of MARPOL Annex V, in particular with a view to producing reduced quantities of waste and to reducing legal discharges, by managing its waste in a sustainable and environmentally sound manner."
(6) Protection and restoration of biodiversity and ecosystems	*This criterion is not in the scope of this call for feedback.*

Rationale

SC criteria

1) Air Pollution

The nature of the engine on board defines GHG and air pollutants, therefore it is assumed that Pollution SC will be reviewed on a 3 yearly basis along with Climate Mitigation SC.

Air emissions screening criteria refer to the existing IMO Emission Control Areas (ECAs) designated under MARPOL Annex VI, which require specific stringent limitations to emissions of SOx, NOX and PM within designated sensitive/Emission Control Areas (such as Baltic Sea, North Sea and North American area). The SC require that vessels comply with these

requirements regardless of the area in which they operate. In addition, thevessels have to be able to “plug in” into onshore power supply (OPS) and not run the auxiliary engines while at berth.

Recognising that alternative fuels such as biofuels, hydrogen and ammonia can be related to NOx emissions, the reduction of such emissions to levels compliant with MARPOL Annex VI for Emission Control Areas (ECA) for NOx should be achieved through design of the engine or use of Exhaust Gas Recirculation (EGR) or Selective Catalytic Reduction (SCR).

Compliance with MARPOL Annex VI for Emission Control Areas (ECA) for SOx can not be met through application of the exhaust gas cleaning systems (EGCS or SOx scrubbers), due to their detrimental impacts on water quality and biodiversity - see DNSH for Sustainable use of water and marine resources.

Compliance with ECA SOx requirements can be met through operating on fuel with less than 0.1% sulphur content. If this is the choice made by the asset owner/operator, then this becomes the operational criteria and it has to be covenanted in the financial and contractual agreements between financial institutions/asset owners/operators and reported ex post minimum annually along with other operational requirements under point 5.

2) Oil pollution

SC goes beyond the current requirement of achieving maximum levels of oil in bilge and other waste waters of 15ppm. SC requires that no oil is discharged within 12 miles from the shore. Beyond 12miles from the shore oil content in discharged bilge waters cannot be higher than 5ppm in line with OSPAR convention requirements (applicable to offshore drilling platforms) and Canadian legislation applicable to the Great Lakes area. In addition, under “operational “ requirements 5 b) ensure that the operators have established relevant procedures and management systems to assure minimization of the pollution from oil by regular maintenance and monitoring of the Bilge Water System.

3) Water Pollution

More stringent requirements than Marpol Annex IV (regulations regarding the discharge of sewage into the sea from ships, including regulations regarding the ships' equipment and systems for the control of sewage discharge). The SC will require that vessels do not discharge any black or grey waters within 12 miles from the shore (versus currently permitted treated

discharges 3 miles from the shore). Discharge is permitted 12 nautical miles from the shore for vessels compliant with Marpol Annex IV Resolution MEPC.159(55).

4) Noise

Vessels need to limit their underwater noise emissions. While there is lack of existing in international or national regulation providing specific noise level emissions as reference points for large vessels, the IMO has established Guidelines for the Reduction of Underwater Noise from Commercial Shipping. According to Gassmann (2017) the vessels can achieve the underwater sound reduction of 6 dB in the low- frequency band (8 - 100 Hz) and a median of 8 dB in the high-frequency band (100 - 1000 Hz)

SC therefore refers to and not exceeding 171 – 3 log f(Hz) for 10 Hz – 1 000 Hz and 162 – 12 log f(kHz) for 1 kHz – 100 kHzin quiet cruise conditions at speed of 11knots (equivalent to the DNV silent class E) , which needs to be proven through measurements in line with ISO 17208/2:2019 and relevant certificates. The reference to the DNV standards has been removed from the SC and it was replaced with the maximum underwater noise limit. It is recognised that a number of institutions (IMO, EMSA) are undertaking studies and reviews of underwater noise emissions from vessels and specific reference points may be established by regulators in the future for specific vessel types.

5) Operational requirements should be covenanted in the financial and contractual agreements between financial institutions/asset owners/operators and reported ex post minimum annually.

Operational requirement a) relates to speed reduction to levels of 10 and 12 knots depending on the vessel type. For sea vessels, studies demonstrate that lower operational speed not only brings benefits in terms of GHG emissions, but also air pollution, underwater noise pollution and decreases risks related to collision with marine life. CE DELFT 2017 assessed speed limit regulations and found that:

- In the period up to 2030, baseline CO2 emissions could be reduced by 13, 24 and 33% if the ships reduced their speed by 10, 20 and 30%.

- While setting a maximum speed limit is the most environmentally effective way to cut emissions, it is recognised that such solution is technically challenging for vessels. However, max average speed allows for operational demands such as weather conditions, vessel safety concerns or other temporary challenges.

- Recognising a variety of ship types and sizes and their designed speed differentiated speed limit is proposed.

Based on these findings, and considering current average speed values for various ship types as per 2015 data derived from the global Automatic Identification System (AIS), a differentiation of speed limits depending on ship types is proposed in the SC. Given 12 knots is already the current average speed for bulk carriers, most chemical tankers and general cargo ships, a 10 knots maximum average speed limit will deliver substantial contribution to the objective. From AIS 2015 data, annual average speed of containerships range from 13.60 knots to 16.86 knots, depending on the size. CE DELFT 2017 study demonstrates that -30% annual average speed reduction compared to 2015 values will achieve emissions reduction that leads to 33% of GHG reduction (and related air emissions). In absolute terms, speed reduction by 30% results in average maximum speed of 9.5-11.8 knots depending on the size of containerships. In this context, a maximum average speed of 12 knots will provide SC to the objective.

In addition: 12 knot speed reduction has direct impacts at underwater noise reduction (Veirs 2018) and reduces the cetacean mortality with 50% less lethal injuries (Vanderlaan, A. S. M., & Taggart, C. T. (2007). Vessel collisions with whales: the probability of lethal injury based on vessel speed. Marine Mammal Science, 23(1), 144–156)

(only for EC reference) Justification against CII-based criteria:

- Carbon intensity improvements are efficient to decrease emissions, but these cannot contribute to reducing noise levels or risks of collision with marine life, which are directly connected to speed.

- Moreover promoting CII seems out of place in the EU green taxonomy, as the EU as a whole has voted against the CII proposal in the latest IMO's MEPC negotiations. The EU called for a 22 percent carbon intensity reduction target between 2019 and 2030, and the U.S. pushed for cuts up to 53 percent, which would bring the maritime sector in line with the 1.5 degrees objective. Despite that, the IMO decided on an 11 percent cut by 2026, with further targets to be settled at a later stage. This is extremely weak in terms of ambition: -11% by 2026 means less than reductions that would be achieved by the sector when following a business as usual trend.

Operational requirements 5 b/d/e ensure that the operators have established relevant procedures and management systems to assure minimization of the pollution from grey and black water apply and require that:

- Vessels are certified and regularly verified in accordance with ISO14001 to ensure that installed water treatment systems, oil removal systems and other abatement technologies and discharged of waste and oily water meet relevant legal requirements and operational policies;

- Zero discharge in Marine Protected Areas regardless of the by laws set in specific MPAs, to limit impacts on sensitive ecosystems.

Operational requirement e) refers to operators using blockchain-based digital tracking systems, which helps customers, shipping lines, freight forwarders, port authorities and customs authorities manage and track the paper trail by digitizing the supply chain process from end to end.

International platforms already exist to establish a digital baseline to connect stakeholders across the transport chain, including carriers, terminal operators, customs agencies, shippers, and logistics service providers, to support improved collaboration and to establish standards that can facilitate the seamless sharing of documents and data.

The purpose of this is for operators to be accountable for cargo lost at sea, and to track the types of cargo carried minimising the risk to biodiversity from illegal wildlife trafficking, products linked to deforestation and pollution from exports of hazardous waste.

DNSH criteria

Climate change adaptation: Aligned with Appendix A Annex 1 DA Circular Economy: Compliance with Annex V to MARPOL (Regulations for the prevention of pollution by garbage from ships along with 2017 adopted resolution on implementation of MARPOL ANNEX V), EU regulation in regards discharge of waste from ships and ship recycling facilities and battery recycling .

8.2 Sea and coastal passenger water transport

Description of the activity

Purchase, financing, chartering (with or without crew) and operation of vessels designed and equipped for performing passenger transport, on sea or coastal waters, whether scheduled or not. The economic activities in this category include operation of ferries, water taxis and excursions. Cruise ships and super yachts with crew are excluded.

The activity could be associated with several NACE codes, in particular H50.10, N77.21 and N77.34 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

Where an economic activity in this category does not fulfil the substantial contribution criterion specified in point 1(a) of this Section, the activity is a transitional activity as referred to in Article 10(2) of Regulation (EU) 2020/852, provided it complies with the 1(b) technical screening criteria and the remaining screening criteria both technical 2, 3 and 4 and operational 5 [578] set out in this Section.

Substantial contribution to pollution prevention and control
1.The activity complies with either one of the following criteria for air pollution: a) Zero direct emissions (exhaust stack) fleet SOx, NOx, PM b) Until 31st December 2025 vessels are compliant with the general requirements of MARPOL Annex VI for Emission Control Areas (ECA) for SOx, NOx and PM regardless of the area of operation and having zero direct emission technology at berth. 2.The activity complies with one or more of the following criteria for oil pollution a) Vessels that operate at less than 12 miles from shore commit to a zero oily residue discharge from bilge water, stern tube/propeller shaft oil leakage and other oily wash water. Vessels are equipped with specific treatment systems to process bilge water down to 0 ppm and seawater stern tube lubrication systems.

[578] Fulfilling of the operational criteria will be evidenced via relevant policies and procedures by vessels operators, or via relevant contractual obligations on the vessels charters/ operators posed by vessel owners.

b) Vessels that operate more than 12 miles from the shore are equipped with IBTS (Integrated Bilge Water Treatment System) meeting the requirements of regulation 14 of the MARPOL Annex I and with real-time discharge quality monitoring system. The quality of the discharged bilge water must meet the threshold of 5 ppm oil in the water without dilution.

3.The activity complies with one or more of the following criteria for water pollution

a) Vessels that operate at less than 12 miles from shore commit to a zero discharge of any kind of wastewater (grey and black water). Vessels are equipped with wastewater retention tanks and sewage collection systems to be emptied during stopovers in ports' terminals.
b) Vessels that operate beyond 12 miles from shore are equipped with on board treatments' systems approved by the Administration in accordance with regulation ANNEX 22 RESOLUTION MEPC.227(64) (2012 Guidelines on Implementation of Effluent Standards and Performance Tests for Sewage Treatment Plants) developed for Special Areas, irrespective if they operate within or outside of the Special Area under Annex IV. All waste waters to be treated and discharged only after treatment and only beyond 12 miles from the shore.

4.The activity complies with either one of the following criteria for underwater noise pollution:

a) Vessels must implement IMO recommendations from IMO MEPC.1/Circ.833: Guidelines for the Reduction of Underwater Noise from Commercial Shipping to Address Adverse Impacts on Marine Life with proper detailed measures based on the three primary sources of underwater noise, namely on propellers, hull form, on-board machinery, and various operational and maintenance recommendations such as hull cleaning.
b) Vessels should be equipped with silencers or other quietening systems.

AND

5.The activity complies with ALL following operational requirements :

a) ISO 14001 standard certification must be required to verify correct operation of abatement technologies on board and legal compliance;

b) The operator has established strict procedures and ensures regular maintenance and continuous training on operation, maintenance and verifications of Integrated Bilge Water Treatment and Monitoring System systems.
c) The operator commits to an overflow STP plan to ensure untreated or partially treated sewage is not directed into the bilge or ballast systems.
d) The operator commits to Zero discharge in Marine Protected Areas regardless of the bylaws set in specific MPAs.

6) Activity is not related to purchase, financing, chartering (with or without crew) and operation of cruise ships and Super Yachts (over 24 meters long).

Do no significant harm ('DNSH')

(1) Climate change mitigation	*This criterion is not in the scope of this call for feedback.*
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.
(3) Sustainable use and protection of water and marine resources	*This criterion is not in the scope of this call for feedback.*
(4) Transition to a Circular Economy	Measures are in place to manage waste, both in the use phase and in the end-of-life of the vessel, in accordance with the EU waste hierarchy.

	For battery-operated vessels, those measures include reuse and recycling of batteries and electronics, including critical raw materials therein. For activities with ships above 500 gross tonnage, the activity complies with the requirements of Regulation (EU) No 1257/2013 relating to the control and management of hazardous materials on board of ships and the requirements applicable for their recycling. In particular, measures are in place to ensure ships intended for scrappage are recycled in facilities included on the European List of ship recycling facilities as laid down in Commission Implementing Decision 2016/2323. The activity complies with Directive (EU) 2019/883 as regards the protection of the marine environment against the negative effects from discharges of waste from ships. The ship is operated in accordance with Annex V to the IMO MARPOL Convention and ANNEX 21 Resolution MEPC.295(71) (Adopted On 7 July 2017) 2017 Guidelines for the implementation of MARPOL Annex V, in particular with a view to producing reduced quantities of waste and to reducing legal discharges, by managing its waste in a sustainable and environmentally sound manner.
(6) Protection and restoration of biodiversity and ecosystems	*This criterion is not in the scope of this call for feedback.*

Rationale

TECHNICAL SCREENING CRITERIA

Air Emissions

Air emissions screening criteria refer to the existing IMO Emission Control Areas (ECAs) designated under MARPOL Annex VI, which require specific stringent limitations to emissions

of SOx, NOX and PM within designated sensitive/Emission Control Areas (such as Baltic Sea, North Sea and North American area). The SC requires that vessels comply with these requirements regardless of the area in which they operate. In addition, the vessels have to be able to “plug in” into onshore power supply (OPS) and not run the auxiliary engines while at berth. Compliance with MARPOL Annex VI for Emission Control Areas (ECA) for SOx can not be met through application of the exhaust gas cleaning systems (EGCS or SOx scrubbers), due to their detrimental impacts on water quality and biodiversity - see DNSH for Sustainable use of water and marine resources.

Recognising that alternative fuels such as biofuels, hydrogen and ammonia can be related to NOx emissions, the reduction of such emissions to levels compliant with MARPOL Annex VI for Emission Control Areas (ECA) for NOx should be achieved through design of the engine or use of Exhaust Gas Recirculation (EGR) or Selective Catalytic Reduction (SCR).

Oil pollution

SC goes beyond the current requirement of achieving maximum levels of oil in bilge and other waste waters of 15ppm. SC requires that no oil is discharged within 12 miles from the shore. Beyond 12miles from the shore oil content in discharged bilge waters can not be higher than 5ppm in line with OSPAR convention requirements (applicable to offshore drilling platforms) and Canadian legislation applicable to the Great Lakes area. In addition, under “operational “ requirements 4 b) ensure that the operators have established relevant procedures and management systems to assure minimization of the pollution from oil by regular maintenance and monitoring of the Bilge Water System.

Water Pollution

More stringent requirements than Marpol Annex IV (regulations regarding the discharge of sewage into the sea from ships, including regulations regarding the ships' equipment and systems for the control of sewage discharge). The SC will require that vessels do not discharge any bleach or grey waters within 12 miles from the shore (versus currently permitted treated discharges 3 miles from the shore). Discharge is permitted 12 nautical miles from the shore only by vessels compliant with stricter provisions in regards to waste water quality of Marpol Annex IV, which are developed for Special areas (currently only legally applicable at Baltic Sea) regardless of their area of operation.

In addition under “operational “ requirements 4 a/c/d ensure that the operators have established relevant procedures and management systems to assure minimization of the pollution from grey and black water

apply and require that:

- Vessels are certified and regularly verified in accordance with ISO14001 to

ensure that installed waster treatments systems and discharged of waste water

meet relevant legal requirements and operational policies;

- Zero discharge in Marine Protected Areas regardless of the by laws set in specific MPAs, to limit impacts on sensitive ecosystems.

Noise

Vessels need to limit their underwater noise emissions. While there is a lack of existing international or national regulation providing specific noise level emissions as reference points for large vessels, the IMO has established Guidelines for the Reduction of Underwater Noise from Commercial Shipping. It is recognised that a number of institutions (IMO, EMSA) are undertaking studies and reviews of underwater noise emissions from vessels and specific reference points may be established by regulators in the future for specific vessel types. Therefore, the SC does not at this stage refer to specific noise threshold or reduction value, but requires evidence of adoption of IMO Guidelines in vessel design and operation and equipping the vessel with silencers or other quietening systems. This requirement is aligned with good international practice as applied by a number of authorities worldwide (example Port of Vancouver).

DNSH:

Adaptation: Aligned with Appendix A Annex 1 DA

Circular Economy: Compliance with Annex V to MARPOL (Regulations for the prevention of pollution by garbage from ships), EU regulation in regards discharge of waste from ships and ship recycling facilities.

EXCLUSIONS:

Exclusion of cruise ships and super yachts with crew

The cruise ships sector presents a range of services from luxury experience to more affordable offers to all kinds of tourists all over the world. While the cruising activity started a century ago with boats carrying up to 300 passengers, recent boats are floating cities with more than 6000 passengers on-board. Each passenger can use up to 40 litres of water per day through the 'black water' system (heavily contaminated wastewater from toilets) and 340 litres of 'grey water' containing harmful chemicals as well as plastic microfibers from washing machine wastewater as well as 4 kilos of solid waste per day (Carić, 2010b). Such volumes raise some concerns in terms of sustainability, especially in terms of energy needs to supply all the treatment systems plus the daily life with shops and attractions as well as means of transport to the cruise ships usually reliant on long-haul flights. Although innovation could provide some solution, the first round of Taxonomy will not take this sector into account as no examples of zero discharge and zero pollution cruise boats are available on an asset base.

In brief, the cruise sector cannot make a Substantial contribution to the environmental objective: evidence of generation of high volumes of solid waste (1:4 ratio in comparison with residents of inland destinations visited by cruises); generation of large quantities of black and grey waters (up to 40 litres of water per day through the 'black water' system (heavily contaminated wastewater from toilets) and 340 litres of 'grey water'), which are discharged mainly in coastal and sensitive areas due to vessels destinations and long time spent at berth, contribution to local air pollution due to large power demand onboard while docked; in addition review of the economic benefits brought by cruise line industry to inland destinations revealed low contribution to local economies due to business model incentifying spending on board)

Looking at the large yacht fleet, the carrying capacity of the main sectors' destinations has already reached major impacts on marine habitats though seabed destruction by massive anchors (Medtrix, 2019) which prevention through a Technical Screening Criteria definition is not possible for the moment.

8.3 Retrofit and upgrade of vessels for the transport of freight on vessels designed for operating on sea or coastal waters

Description of the activity

The economic activities in this category could be associated with several NACE codes, in particular H52.2, H50.2 and C33.15 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

Substantial contribution to pollution prevention and control
1. The retrofitting activity brings the vessel into compliance at the stage of vessel manufacturing/commissioning set out in the points 1, 2, 3, and 4 of the Technical Screening Criteria pollution prevention and control of Sea and coastal freight water transport. 2. The retrofitting activity brings the vessel into compliance at the operational stage set out in the points 5 and 6 of the Technical Screening Criteria to pollution prevention and control of Sea and coastal freight water transport.[579]

Do no significant harm ('DNSH')	
(1) Climate change mitigation	*This criterion is not in the scope of this call for feedback.*
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.
(3) Sustainable use and protection of	*This criterion is not in the scope of this call for feedback.*

[579] Fulfilling of the operational criteria will be evidenced via relevant policies and procedures by vessels operators, or via relevant contractual obligations on the vessels charters/ operators posed by vessel owners.

water and marine resources	
(4) Transition to a Circular Economy	Measures are in place to manage waste, both in the use phase and in the end-of-life of the vessel, in accordance with the waste hierarchy. For battery-operated vessels, those measures include reuse and recycling of batteries and electronics, including critical raw materials therein. For activities with ships above 500 gross tonnage, the activity complies with the requirements of Regulation (EU) No 1257/2013 relating to the control and management of hazardous materials on board of ships and the requirements applicable for their recycling. In particular, measures are in place to ensure ships are recycled in facilities included on the European List of ship recycling facilities as laid down in Commission Implementing Decision 2016/2323. The activity complies with Directive (EU) 2019/883 of the European Parliament and of the Council as regards the protection of the marine environment against the negative effects from discharges of waste from ships. The ship is operated in accordance with Annex V to the International Convention for the Prevention of Pollution from Ships of 2 November 1973 (the IMO MARPOL Convention) and ANNEX 21 Resolution MEPC.295(71) (Adopted On 7 July 2017) 2017 Guidelines for the implementation of MARPOL Annex V, in particular with a view to producing reduced quantities of waste and to reducing legal discharges, by managing its waste in a sustainable and environmentally sound manner.".
(6) Protection and restoration of	*This criterion is not in the scope of this call for feedback.*

biodiversity and ecosystems	

Rationale

8.4 Retrofit and upgrade of vessels for the transport of passengers on vessels designed for operating on sea or coastal waters

Description of the activity

The economic activities in this category could be associated with several NACE codes, in particular H52.2, H50.2 and C33.15 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

Substantial contribution to pollution prevention and control

1. The retrofitting activity brings the vessel into compliance at the stage of vessel manufacturing/commissioning set out in the points 1,2,3, and 4 of the Technical Screening Criteria pollution prevention and control of Sea and coastal passenger water transport.

2. The retrofitting activity brings the vessel into compliance at the operational stage set out in the points 5 and 6 of the Technical Screening Criteria to pollution prevention and control of Sea and coastal passenger water transport.[580]

Do no significant harm ('DNSH')

[580] Fulfilling of the operational criteria will be evidenced via relevant policies and procedures by vessels operators, or via relevant contractual obligations on the vessels charters/ operators posed by vessel owners.

(1) Climate change mitigation	*This criterion is not in the scope of this call for feedback.*
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.
(3) Sustainable use and protection of water and marine resources	*This criterion is not in the scope of this call for feedback.*
(4) Transition to a Circular Economy	*This criterion is not in the scope of this call for feedback.*
(6) Protection and restoration of biodiversity and ecosystems	*This criterion is not in the scope of this call for feedback.*
Rationale	

8.5 Inland freight water transport

Description of the activity

Freight inland water transport of any kind, the activity is classified under the NACE Code H50.4 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006

The next activities fall out of the scope of the activity:

- Vessels used principally for the carriage of passengers
- Vessels used for ferrying purposes
- Vessels used solely for non-commercial purposes by port administration and public authorities
- Vessels not used for the carriage of goods such as floating workshops, houseboats and pleasure craft.

Where an economic activity in this category does not fulfil the substantial contribution criterion specified in point (a) of this Section, the activity is a transitional activity as referred to in Article 10(2) of Regulation (EU) 2020/852, provided it complies with the remaining technical screening criteria set out in this Section.

Substantial contribution to pollution prevention and control

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1. Activity is not related to the transportation of fossil fuels and fossil fuel bunkering; transport of hazardous waste that are intended for final disposal expert if there is proper treatment infrastructure for reception; nuclear waste; products linked to deforestation soy, timber, palm oil and beef, unless they are provided with deforestation-free supply chain certification

2.The activity complies with one or more of the following criteria for air pollution:

a) Zero tailpipe direct emissions fleet (SOx, NOx, PM) during navigation, operations and at berth
b) Until 2025, vessels compliant with Regulation 2016/1628 (Stage V engine) and zero direct emission at berth.

3. The activity complies with the following criterion for oil pollution:

Zero oil discharge from bilge waters or other sources. Vessels are equipped with storage tanks to be emptied in ports facilities, or if no ports are equipped with relevant facilities in the region, vessels are equipped with appropriate treatment systems to reach 0 ppm oil residue in water discharge. It is prohibited the use of mobile reservoirs stored on deck as reservoirs for the collection of used oil

4. The activity complies with the following solid waste criteria:

Vessels equipped with facilities for the collection and storage of vessel operation refuse. A separate container must be provided for vessel operation refuse. The volume of household refuse collection facilities Vhr shall be calculated, following the CDNI convention, by the formula Vhr = Ghr x N x T[581]

Household refuse-collection equipment must have tightly-closing lids and be installed in well-ventilated areas and must have fittings allowing them to be securely attached to the deck, in compliance with the relevant navigation security certificateno incineration is present on board

5. The activity complies with the following noise (above water) criteria:

a) Noise emitted by vessels under way, in particular engine intake and exhaust noise, shall be damped by appropriate means.
b) Noise emitted by vessels shall not exceed 70 dB(A) air sound emission at a lateral distance of 25 m from the shipside.
c) With the exception of trans-shipment operations, the noise emitted by stationary vessels shall not exceed 60 dB(A) at a lateral distance of 25 m from the shipside.

6. Operators must be equipped with proper GPS localisation system, installation and use of River Information Services (RIS) equipment when operating within waterways covered by TEN-T Network if available in the operation area, and an AIS system in any case.

7. The activity complies with the following operational requirements :

a) Vessels will have a median speed of 15km/h at all time during navigation operation.
b) Zero dumping or discharging waste generated on board or any part of the cargo from vessels into the waterways. Dumping or discharging of any part of the cargo or cargo-related waste, domestic refuse, slops, sewage, cleansing slurry and other special waste into the waterway from vessels is prohibited. The boatmaster may deposit waste generated on board at the reception stations in ports.
c) Each motorised vessel that uses gas oil must have on board a valid used-oil log, issued by the competent authority. Seagoing vessels that have a Oil Control Book as provided

[581] Respectively, Ghr for household refuse discharge per person per day according to operating conditions; N for maximum admissible number of people on board; T for period between emptyings of the on-board collection facilities.

for in the International Convention for the Prevention of Pollution from Ships (Marpol) are not subject to this requirement

d) ISO 14001 standard certification must be required to verify correct operation of abatement technologies onboard, compliance with relevant environmental policies and procedures as well as legal compliance

Do no significant harm ('DNSH')

(1) Climate change mitigation	*This criterion is not in the scope of this call for feedback.*
(2) Climate change adaptation	*This criterion is not in the scope of this call for feedback.*
(3) Sustainable use and protection of water and marine resources	*This criterion is not in the scope of this call for feedback.*
(4) Transition to a Circular Economy	Measures are in place to manage waste, both in the use phase and in the end-of-life of the vessel, in accordance with the waste hierarchy.
(6) Protection and restoration of biodiversity and ecosystems	*This criterion is not in the scope of this call for feedback.*

Rationale

The SC and DNSH criteria refer to the revised regulation on Stage V engine and ES-TRIN rules for Inland Navigation vessels.

Air pollution

New and refurbished vessels compliance with the non road mobile machinery Stage V (latest standards) bring the room to the sector to invest in more virtuous propulsion mode, with a sunset clause to incentivise new equipment based on a non-fossil fuel engine.

Water pollution:

The sector can ensure full management of all discharges through the compliance of a zero discharge involvement.

Solid Waste:

The measures above are taken in order to avoid the dumping of solid waste on the water and/or river shoreline. Solid waste is a major cause of pollution in rivers as it may alter the oxygen content of water, its composition and it might induce the introduction of other dangerous elements i.e. plastics. The measures are in line with the recommendations on Harmonized Europe-Wide Technical Requirements for Inland Navigation Vessel-Resolution No. 61, Revision 2.

Noise pollution:

Reduction of the aerial noise is needed to avoid disturbance on the local fauna. The limits have been set up following the recommendations on Harmonized Europe-Wide Technical Requirements for Inland Navigation Vessel-Resolution No. 61, Revision 2. The speed reduction criteria is more specific to an underwater sound pollution reduction and remains the only effective measure that applies which require vessels to be equipped by GPS localisation systems for monitoring. Such substantial contributions will have positive effects on biodiversity issues especially on habitat loss. The issue of riverbank erosion has not been considered as part of the environmental target (riverbank destruction remains a natural process). Ecosystem function loss induced by the sector can be tackled through a 5km/h speed limit. However, such limit would hamper the modal shift opportunity between road and river transport, a speed limit of 15 km/h is this applied, cf case study of Ráckevei-Soroksári Dunaág (58 km long dammed left side arm from Budapest to Dunaújváros) with passing navigation route close to special protected areas (floating bogs) requiring 5 km/h, and 15 km/h any other case.

8.6 Inland passenger water transport

Description of the activity

Purchase, financing, chartering (with or without crew) and operation of vessels designed and equipped for performing passenger transport, on inland waters, whether scheduled or not, involving vessels that are not suitable for sea transport. . The economic activities in this category include operation of ferries, water taxis and public transport. Cruise ships and high speed boats are excluded.

The activity could be associated with NACE code H50.30 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

Fulfilling of the operational criteria will be evidenced via relevant policies and procedures by vessels operators, or via relevant contractual obligations on the vessels charters/ operators posed by vessel owners.

Substantial contribution to pollution prevention and control

1. The activity complies with the following criteria for air pollution:

Zero tailpipe direct emissions fleet (SOx, NOx, PM) during navigation, operations and at berth and equipped with on board OPS system.

2. The activity complies with the following criteria for oil pollution:

reach 0 ppm oil residue in water discharge

3. The activity complies with the following criteria for water pollution:

On-board sewage plants must comply with the following limits during the type test:

Parameter	Oxygen concentration	Sample
BOD	20 mg/l	24-h-composite sample, homogenised
	25 mg/l	Sample, homogenised
COD	100 mg/l	24-h-composite sample, homogenised
	125 mg/l	Sample, homogenised
Total Organically Bound Carbon (TOC)	35 mg/l	24-h-composite sample, homogenised
	45 mg/l	Sample, homogenised

4. The activity complies with the following noise (above water) criteria:

Noise emitted by vessels under way, in particular engine intake and exhaust noise, shall be damped by appropriate means.

Noise emitted by vessels shall not exceed 70 dB(A) air sound emission at a lateral distance of 25 m from the shipside.

With the exception of trans-shipment operations, the noise emitted by stationary vessels shall not exceed 60 dB(A) at a lateral distance of 25 m from the shipside.

Do no significant harm ('DNSH')

(1) Climate change mitigation	*This criterion is not in the scope of this call for feedback*.
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.

	The economic activity has implemented physical and non-physical solutions ('adaptation solutions') that reduce the most important physical climate risks that are material to that activity.
(3) Sustainable use and protection of water and marine resources	*This criterion is not in the scope of this call for feedback.*
(4) Transition to a Circular Economy	Measures are in place to manage waste, both in the use phase and in the end-of-life of the vessel, in accordance with the waste hierarchy. For battery-operated vessels, those measures include reuse and recycling of batteries and electronics, including critical raw materials
(6) Protection and restoration of biodiversity and ecosystems	*This criterion is not in the scope of this call for feedback.*

Rationale

The SC and DNSH criteria are set to encourage the development of sustainable water public transport. Water buses already exist in many cities (Paris, Geneva, Berlin, Bruxel) and require more financial support that can be driven through the new Taxonomy disposition. The sector can make a substantial contribution by reducing the energy cost and time in dense traffic areas. The regulation in place in cities on air emission and discharge must apply.

Air pollution

New and refurbished vessels compliance with the non road mobile machinery Stage V (latest standards) bring the room to the sector to invest in more virtuous propulsion mode, with a sunset clause to incentivise new equipment based on a non-fossil fuel engine.

Water pollution:

The sector can ensure full management of all discharges through the compliance of a zero discharge involvement.

Solid Waste:

The measures above are taken in order to avoid the dumping of solid waste on the water and/or river shoreline. Solid waste is a major cause of pollution in rivers as it may alter the oxygen content of water, its composition and it might induce the introduction of other dangerous elements i.e. plastics. The measures are in line with the recommendations on Harmonized Europe-Wide Technical Requirements for Inland Navigation Vessel-Resolution No. 61, Revision 2.

Noise pollution:

Reduction of the aerial noise is needed to avoid disturbance on the local fauna. The limits have been set up following the recommendations on Harmonized Europe-Wide Technical Requirements for Inland Navigation Vessel-Resolution No. 61, Revision 2.

8.7 Urban and suburban passenger land public transport

Description of the activity

Operation of urban and suburban transport systems for passengers and road passenger transport. This may include different modes of land transport, such as by motor bus, tramway, streetcar, trolley bus, underground and elevated railways. The transport is carried out on scheduled routes normally following a fixed time schedule, entailing the picking up and setting down of passengers at fixed stops. The activity also includes town-to-airport or town-to-station lines and operation of funicular railways and aerial cableways which are part of urban or suburban transit systems. The activity also includes scheduled long-distance bus services, charters, excursions and other occasional coach services, airport shuttles, operation of school buses and buses for the transport of employees and other passenger transport by man- or animal-drawn vehicles. This activity excludes ambulance transport. It includes operation of vehicles designated as category M2 or M3, in accordance with Article 4(1) of Regulation (EU) 2018/8582, for the provision of passenger transport.

The economic activities in this category could be associated with several NACE codes, in particular:

- · H49.31 - urban and suburban passenger land transport
- · H49.32 - Taxi operation
- · H49.39 - other passenger land transport n.e.c. (private hire)
- · N77.39, N77.11 - leasing of vehicles for taxi operation, private hire, trams, subway and buses

in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

Substantial contribution to pollution prevention and control
1. The activity complies with one or more of the following criteria for air pollution: a) zero tailpipe emissions (coherently with the Climate Mitigation SC) 2. The activity complies with one or more of the following criteria for noise pollution: a) For road vehicles of categories M and N, tyres comply with at least X dB less than the limit value LV (X between -6dB and -3dB) as outlined in UNECE Regulation No. 117 for the corresponding period of its application.

Do no significant harm ('DNSH')	
(1) Climate change mitigation	*This criterion is not in the scope of this call for feedback.*
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852
(3) Sustainable use and protection of	N/A

water and marine resources	
(4) Transition to a Circular Economy	Measures are in place to manage waste, in accordance with the waste hierarchy, both in the use phase (maintenance) and the end-of-life of the fleet. For battery-operated fleets, those measures include reuse and recycling of batteries and electronics, including critical raw materials therein.
(6) Protection and restoration of biodiversity and ecosystems	N/A

Rationale

SC criteria

Air pollution:

As indicated by the European Environment Agency, transport consumes one third of all final energy in the EU and as the bulk of this energy still comes from oil, which is processed in the internal combustion engines, the transport sector is responsible for a large share of the EU's greenhouse gas emissions (GHG). The transport sector contributed 27% of total GHG emissions in the EU[582], where emissions from road transport in 2018 were ~23.05 % above 1990 levels[583] (cars - 17.52%, light duty trucks - 58.19%, heavy duty trucks - 23.94%, motorcycles - 9.96%, other - 5.47%); as such, the sector has proven difficult to decarbonise as

[582] TERM 002 Published 18 Dec 2020

[583] https://di.unfccc.int/time_series

it has not shown the same gradual decline in emissions since 1990 as other sectors; emissions only started to decrease in 2007 and still remain higher than in 1990. Within the transport sector, road transport in particular constitutes the highest proportion of overall transport GHG emissions (around 71 % in 2018; the remainder coming mainly from shipping and aviation). In the EU, 55.7% of all public transport journeys (or 32.1 billion passenger journeys per year) are made by urban and suburban buses[584].

Exhaust emissions

i. Air pollution: further to GHG emissions, transport also continues to be a significant source of air pollution, with air pollutants, such as particulate matter (PM), particle number concentration (PN), nitrogen oxides (NOX, which comprises a mixture of nitric oxide NO and nitrogen dioxide NO2), being harmful to human health and the environment. NO2 is a toxic gas that causes approximately 79,000 premature deaths in Europe per year, while concentrations of PM2.5 were responsible for about 391,000 premature deaths in 28 EU Member States. In the air, NO is also converted to NO2 in a process that forms ozone (O3). NOx emissions also form secondary particles in the air and contribute to acidification and eutrophication, causing serious damage to ecosystems. The road transport sector represents the largest source of NOx emissions, accounting for 39% of total EU emissions in 2018. It is also a major source of primary PM2.5, PM10, black carbon (BC) and Pb emissions. Passenger cars, heavy-duty vehicles and buses are the principal contributors to NOX emissions from this sector; in 2018, passenger cars alone contributed around 70% of CO emissions from the road transport sector[585]. Although emissions of NOX from the road transport sector fell by 63% between 1990 and 2018. Nevertheless, in the EU, this sector is a major source of the ground-level O3 precursors NOX, CO and non-methane volatile organic compound (NMVOCs): in 2018, it contributed 39%, 20% and 8%, respectively, to the total emissions of these pollutants in the EU. In 2018, 48 % of the EU urban population was estimated to be exposed to PM10 above the WHO guideline value, 74 % to PM2.5, 4 % to NO2 and 19 % to SO2. The proportion of the

[584] European Automobile Manufacturers' Association. Available online: https://www.acea.be/automobile-industry/buses

[585] EU emission inventory report 1990-2018 under the UNECE Convention on Long-range Transboundary Air Pollution (LRTAP)

population exposed to O3 above the WHO guideline value fluctuated between 94 % and 99 % in the period 2000-2018, with no decreasing trend over time[586].

Traffic volumes are higher in the urban and suburban areas due to urbanization and higher population density. Since urban and suburban areas generally have the most mobility options, the development of a sustainable zero emission public transport system is of key importance as moving increasingly large numbers of people efficiently around a city can only be achieved by expanding mass transit systems.

In order to substantially reduce air pollution from transport in urban and suburban areas the most ambitious level needs to be achieved by switching to zero tailpipe emissions (coherently with the Climate Mitigation SC)

Noise pollution

Noise pollution is another major environmental health problem linked to transport. Transportation and road traffic is the main source of noise pollution in Europe. The World Health Organization (WHO) has estimated that “at least one million healthy life years are lost every year from traffic related noise in the western part of Europe”. Road traffic is the most widespread source of environmental noise, with more than 113 million people (night-time noise more than 78 million) affected by harmful levels (Lden ≥ 55 dB) in the EEA-33 member countries, of these, 36 million are exposed to very high noise levels of at least 65 dB Lden. Railways also contribute to the noise emission: more than 21 million people are exposed to Lden ≥ 55 dB.

Therefore, minimizing noise emission will reduce the negative impact to society and environment.

Regarding vehicle noise:

REGULATION (EU) No 540/2014 on the sound level of motor vehicles and of replacement silencing systems already in place will systematically reduce noise emission. In line with the first DA, noise emission of electric vehicles will have a lower impact on society as far as noise

[586] CSI 004, AIR 003 Published 06 Oct 2020

emission. As a consequence, there was no more restrictive Technical Screening Criteria developed regarding vehicle noise.

Regarding tire noise:

Given that :

-the repartition of the tire noise is not homogenous on the market

C1 (passenger): ~15% of the market in class A labelling

C2 (light truck): ~5% of the market in class A labelling

C3 (heavy truck) : ~45% of the market in class A labelling

-the dependency of the tire noise is also impacting the safety and the energy efficiency of the vehicle.

The ambition is to improve tire noise.

Regarding tire particule:

A suitable testing method to measure tyre abrasion and mileage is not currently available. Therefore, the Commission should mandate the development of such a testing method, taking into full consideration the state of the art and internationally developed or proposed standards and regulations, as well as the work carried out by industry.

As a consequence, no criteria developed.

DNSH criteria

Climate adaptation:

The activity complies with the criteria set out in Appendix A to the Delegated Act on Climate Mitigation.

Transition to a circular economy:

Measures are in place to manage waste, in accordance with the waste hierarchy, both in the use phase (maintenance) and the end of-life of the fleet compliant with Directive 2000/53/EC ("End-of-life of vehicles Directive")

For battery-operated fleets, those measures include reuse and recycling of batteries and electronics, including critical raw materials therein.

8.8 Transport by motorbikes, passenger cars and light commercial vehicles

Description of the activity

Operation of vehicles designated as category M1, N1 or L (2- and 3-wheel vehicles and quadricycles).

The economic activities in this category could be associated with several NACE codes, in particular:

- H49.32 - Taxi operation
- H49.39 - other passenger land transport n.e.c. (private hire)
- N77.11 - Renting and leasing of cars and light motor vehicles

in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

Substantial contribution to pollution prevention and control

1. The activity complies with one or more of the following criteria for air pollution:

a) zero tailpipe emissions (coherently with the Climate Mitigation SC) for all three types of vehicles (M, N, L), or any time sooner, if feasible in terms of technology and economy;

b) until 31 December 2025:

- For M & N category : up to (50%-80%)* of applicable real driving emission (RDE) limits laid down in Annex I to Regulation (EC) No 715/2007 (Euro 5 and Euro 6), or its successor.

2. The activity complies with one or more of the following criteria for noise pollution:

a) vehicles (M, N) with silencing systems compliant with dB level set in EU reg. 540/2014;

b) For road vehicles of categories M and N, tyres comply with at least X dB less than the limit value LV (X between -6dB and -3dB) as set in part C of Annex II, EU reg. 661/2009

c) L vehicle category (mopeds, motorbikes, tri-cycles and quadricycles)– Noise For L category vehicles, the Sound-level limits as set in Reg. 168/2013, under Annex VI (D) for Euro 4 sound level (dB(A)) reduced by 2 dB.

Do no significant harm ('DNSH')

(1) Climate change mitigation	*This criterion is not in the scope of this call for feedback.*
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852
(3) Sustainable use and protection of water and marine resources	N/A
(4) Transition to a Circular Economy	Vehicles of categories M1 and N1 are: (a) reusable or recyclable to a minimum of 85 % by weight;

	(b) reusable or recoverable to a minimum of 95 % by weight[587]. Measures are in place to manage waste both in the use phase (maintenance) and the end-of-life of the fleet, including through reuse and recycling of batteries and electronics (in particular critical raw materials therein), in accordance with the waste hierarchy.
(6) Protection and restoration of biodiversity and ecosystems	N/A

Rationale

SC criteria

1- Air pollution:

a- Zero direct emissions vehicles (e.g. electric, hydrogen) are eligible because they contribute the least to the local concentration of air pollutants (especially NO2). Upstream emissions from the generation of the energy carriers used by zero tailpipe emissions vehicles is not taken into account (but it is assumed to become low or zero emission as the energy generation mix becomes increasingly renewable).

b- Vehicles with tailpipe emission intensity of max 50 g/km CO2(WLTP) are eligible until 2025 because the post-2020 CO2 Regulation for cars and vans sets this threshold as an ambitious mid-term target that is significantly below the expected average emissions of new cars and vans. Also, under the Clean Vehicles Directive (2019/1161), a clean Light Duty Vehicle (LDV)

[587] As set out in Annex I of Directive 2005/64/EC of the European Parliament and of the Council of 26 October 2005 on the type-approval of motor vehicles with regard to their reusability, recyclability and recoverability and amending Council Directive 70/156/EEC (OJ L 310, 25.11.2005, p. 10).

must emit no more than 80% of the latest emission limits under RDE (corresponding to 64 mg NOx/km).

A threshold range between 50-80% has been included in the criteria. The 50% relates to Annex I to Regulation (EC) No 715/2007. Feedback and further evidences to support a refining of this threshold range is very welcome.

c- Regarding L Vehicle

The 50 g CO2/km threshold does not apply to L vehicles (e.g. motorcycles) due to heterogeneous vehicle technical characteristics among different sub categories (from mopeds to heavy motorbike or micro cars) and different application fields (urban vs rural usage).

The higher threshold for some of the sub categories of L vehicles compared to M and N vehicles reflect the technical and economical challenges to develop Hybrid architecture for these vehicles. L Plug in hybrid vehicles are unlikely to ever be available on the market in significant numbers.

The proposed Technical Screening Criteria is based on an estimation of the lower end of the range of type approval CO2 emission values by sub categories:

L1e - Cycles designed to pedal - 0 g/km (pure electric vehicles)

L2e - Mopeds - Between 40 and 70 g/km

L3e-A1 - Low-performance motorcycles -Between 40 and 70 g/km

L3e-A2 & L5e - Medium-performance motorcycles and tricycles - Between 60 and 100 g/km

L3e-A2 - High- performance motorcycles - Between 80 and 150 g/km

L4e - Any other L3e with sidecar - See L3e

L6e and L7e - light and heavy quadricycles - 50 g/km (tbc)

<u>2- Noise pollution</u>

Noise pollution is another major environmental health problem linked to transport. Transportation and road traffic is the main source of noise pollution in Europe. The World Health Organization (WHO) has estimated that “at least one million healthy life years are lost every year from traffic related noise in the western part of Europe”. Road traffic is the most

widespread source of environmental noise, with more than 113 million people (night-time noise more than 78 million) affected by harmful levels (Lden ≥ 55 dB) in the EEA-33 member countries, of these, 36 million are exposed to very high noise levels of at least 65 dB Lden.

a- Regarding noise vehicles (M, N):

REGULATION (EU) No 540/2014 on the sound level of motor vehicles and of replacement silencing systems already in place will systematically reduce noise emission. In line with the first DA, noise emission of electric vehicles will have a lower impact on society as far as noise emission. As a consequence, there was no more restrictive Technical Screening Criteria developed regarding vehicle noise.

b- Regarding tyre noise:

A threshold noise range limit between -6dB and -3dB has been included in the criteria. Feedback and further evidences to support a refining of this threshold range is very welcome

Given that :

-the repartition of the tire noise is not homogenous on the market

C1 (passenger): ~15% of the market in class A labelling

C2 (light truck): ~5% of the market in class A labelling

C3 (heavy truck) : ~45% of the market in class A labelling

-the dependency of the tire noise is also impacting the safety and the energy efficiency of the vehicle.

The ambition is to improve tire noise.

c- Regarding L category (mopeds, motorbikes, tri-cycles and quadricycles)

The target Sound-level limits as set in Reg. 168/2013, under Annex VI (D) for Euro 4 sound level (dB(A)) reduced by 2 dB is based on a technical and economical feasibility assessment.

Regarding tire particule:

A suitable testing method to measure tyre abrasion and mileage is not currently available. Therefore, the Commission should mandate the development of such a testing method, taking

into full consideration the state of the art and internationally developed or proposed standards and regulations, as well as the work carried out by industry.

As a consequence, no criteria developed.

DNSH criteria

Climate adaptation:

The activity complies with the criteria set out in Appendix E to the Delegated Act on Climate Mitigation.

Transition to a circular economy:

Measures are in place to manage waste, in accordance with the waste hierarchy, both in the use phase (maintenance) and the end of-life of the fleet compliant with Directive 2000/53/EC ("End-of-life of vehicles Directive")

For battery-operated fleets, those measures include reuse and recycling of batteries and electronics, including critical raw materials therein.

8.9 Manufacturing of aircraft

Description of the activity

C30.3 - Manufacturing of aircraft – commercial aircraft

manufacture of airplanes for the transport of goods or passengers, for use by the defence forces, for sport or other purposes

Substantial contribution to climate change mitigation
1. Zero exhaust CO2 emission aircraft such as those powered by electricity or green hydrogen
2. Until end of 2027, commercial aircraft (excluding aircraft categorised as “general aviation” and “business aviation”) meeting the “best in class” criteria below and for which delivery does not increase the global fleet number, as defined by the ratio of [aircraft retired /

aircraft delivered] averaged over the last 10 years as evidenced by publically available data (e.g. Cirium):

1. Regional aircraft (MTOM < 60t) certified to the ICAO CO2 standard with a margin of at least minus 11% to the New Type limit

2. Narrowbody aircraft (60t < MTOM < 150t) certified to the ICAO CO2 standard with a margin of at least minus 2% to the New Type limit.

3. Widebody aircraft (150t < MTOM) certified to the ICAO CO2 standard with a margin of at least minus 1.5% to the New Type limit.

3. From 2028 to 2032, aircraft meeting the criteria [2] above and certified to run on 100% SAF

4. From 2033, aircraft meeting future criteria to be set at upcoming review of the taxonomy. The margins defined in [2a/2b/2c] will be subject to the regular review of the taxonomy taking into account available certified data and technological progress.

These criteria apply to parts and equipment manufacturers and Maintenance, Repair and Overall (MRO) services providers to the extent that the activity can be linked to an eligible aircraft type.

Do no significant harm ('DNSH')

(2) Climate change adaptation	Measures to ensure that changing climate conditions do not compromise safety or airworthiness of the operation of an aircraft.
(3) Sustainable use and protection of water and marine resources	N/A
(4) Transition to a Circular Economy	The activity assesses the availability of and, where feasible, adopts techniques that support: (a) reuse and use of secondary raw materials and re-used components in products manufactured;

	(b) design for high durability, recyclability, easy disassembly and adaptability of products manufactured; (c) waste management that prioritises recycling over disposal, in the manufacturing process; (d) information on and traceability of substances of concern throughout the life cycle of the manufactured products; (e) A waste management plan is in place and ensures maximal reuse or recycling at end of life in accordance with the waste hierarchy (from the Waste Framework Directive), including through contractual agreements with waste management partners, reflection in financial projections or official project documentation in order to also ensure the scrappage of an aircraft is done respecting applicable EU waste regulation principles.
(5) Pollution prevention and control	(a) Compliance with Directive 2008/50 on ambient air quality; (b) Amendment 13 of Volume I (noise), Chapter 14, of Annex 16 to the Chicago Convention; (c) Amendment 10 of Volume II (engine emissions), Chapters 2 and 4, of Annex 16 to the Chicago Convention; (d) DNSH as set out in Appending C of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852 (e) Other relevant requirements referred to in Article 9(2) of the Regulation (EU) 2018/1139.
(6) Protection and restoration of biodiversity and ecosystems	N/A

Rationale

Transformative technology for even the smallest class of commercial aircraft is still more than a decade away. So-called zero emission aircraft, electric or powered by green hydrogen are expected to first become available for the regional market segment with up to 100 passengers and around 1000 nautical miles range. Airbus recently announced that the first zero-emission commercial aircraft could enter service by 2035. The Commission's sustainable and smart mobility strategy also has the objective that such aircraft will become ready for market by 2035. For aircraft with longer ranges and more seats, which account for the bulk of air transport and CO2 emissions, there is currently no reliable indication when such aircraft will be market ready.

Until then, incremental efficiency improvements of airframes and engines in combination with the use of sustainable aviation fuels (SAF) producing less CO2 over their life cycle than conventional jet fuel are the main mitigation options available to the sector. This means a substantial contribution as defined in Art. 10 (1) of the Taxonomy Regulation (EU) 2020/852 is currently out of reach. However, aviation can be included in the taxonomy as a transition activity pursuant to Art. 10 (2) to the extent that "it supports the transition to a climate-neutral economy consistent with a pathway to limit the temperature increase to 1,5°C above pre-industrial level". The objective is to contribute to mitigating GHG emissions from the sector before transformative technologies become market ready, ensuring a minimum aggregated emission reduction of 20% in the first decade.

Passenger and freight volumes in the EU and global aviation market have grown strongly during past decades. Efficiency improvements were insufficient to compensate for the growing demand which resulted in growing GHG emissions from the sector. The COVID 19 pandemic resulted in a strong reduction in demand, especially for air passenger transport. However, current forecasts predict a return to pre-crisis levels by 2024 with continued growth thereafter.

Therefore, screening criteria for aviation as a transition activity need to achieve three things: (1) incentivise the replacement of old, less efficient aircraft with new, more efficient ones without contributing to fleet expansion; (2) accelerate the development and market introduction of increasingly efficient aircraft without compromising the development of zero-exhaust CO2 emission breakthrough technologies; (3) incentivise the replacement of fossil jet fuel with sustainable aviation fuels, including the technical readiness of the aircraft fleet to operate with high blending ratios.

In response to this, the following screening criteria were agreed:

1) A scrapping rule requiring proof that an old, non-taxonomy compliant aircraft was decommissioned to make a new, more efficient one eligible. For aircraft manufacturers the equivalent requirement is that eligible aircraft cannot contribute to the expansion of the global fleet. This requirement will be verified by identifying the ratio of aircraft being retired versus those being delivered over 10 years, based on publicly available data. The average ratio is averaged over 10 years to ensure a more stable rate reflective of long term trends. This scrapping rule is against the backdrop of current market forecasts predicting that at least half of the new commercial aircraft ordered in the future will be for fleet expansion.

2) Aircraft efficiency requirements based on the ICAO new type (NT) CO2 standard to define which new aircraft can be considered as 'best-in-class' for the purpose of the taxonomy. This criterion is differentiated by three aircraft classes:

- Regional aircraft (strictly below 60 tonnes of maximum take-off mass (MTOM2)

- Narrowbody aircraft (as of 60 and strictly below 150 MTOM)

- Widebody aircraft (above or equal to 150 MTOM)

A margin has been added to these three categories to accurately reflect the best in class performance across current commercial aircraft types and variants.

3) The requirement for aircraft to be 100% sustainable aviation fuel certified from the beginning of 2028 to give the assets included in the transition activity a long-term decarbonisation perspective. In practice, this will only make a difference if blends with more than 50% SAF are used in the future.

4) Manufacturers of parts and equipment used in taxonomy compliant aircraft as well as Maintenance, Repair and Overall (MRO) services should also benefit from the taxonomy given their role in helping aircraft improve their performance.

5) On the operator side, a progressive increase in the use of SAF. The percentages have been chosen to be above any mandatory blending requirements that could be introduced by the EU during the coming years This is to ensure taxonomy criteria go beyond what will be necessary for legal compliance.

Due to the uncertainty involved, it was agreed not to define screening criteria for aviation as a transition activity for the time after 2032. However, this can be re-examined as part of the review defined in the Taxonomy Regulation (EU) 2020/852.

8.10 Passenger air transport

Description of the activity

The economic activities in this category could be associated with NACE code H51.1, and NACE N77.35, in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

Where an economic activity in this category does not fulfil the substantial contribution criterion specified in point 1 (a) of this Section, the activity is a transitional activity as referred to in Article 10(2) of Regulation (EU) 2020/852, provided it complies with the remaining technical screening criteria set out in this Section.

Substantial contribution to climate change mitigation

1. Performed using zero exhaust CO2 emission aircraft such as those powered by electricity or green hydrogen.
2. Until 2030 performed using aircraft meeting criteria as defined in NACE C30.3, acquired with the commitment that an aircraft not compliant with ICAO new type standards, with a size of at least 80% of max take-off weight of the new delivery, is decommissioned within 6 month of delivery of the new aircraft.
3. From 2030 onwards, performed using aircraft meeting criteria [2] and using a minimum of 10% of SAF, increased by 2 percentage points annually thereafter.
4. Performed using aircraft operated with a minimum of 5% SAF in 2022, with the percentage of SAF increasing by 2 percentage points annually thereafter.
5. Until [2024-2026], performed by the proportion of the fleet meeting NACE C30.3 criteria multiplied by the ratio of [aircraft retired / aircraft delivered] averaged over the last 10 years as evidenced by publically available data (e.g. Cirium):

After [1-3] years from the entry into force of the criteria, the taxonomy compliant revenue for air transport will only be determined by the percentage of the revenue generated by the portion of the fleet meeting criteria 1, 2, 3 and 4.

Do no significant harm ('DNSH')	
(2) Climate change adaptation	Measures to ensure that changing climate conditions do not compromise safety or airworthiness of the operation of an aircraft.
(3) Sustainable use and protection of water and marine resources	N/A
(4) Transition to a Circular Economy	(a) Measures are in place to prevent generation of waste in the use phase (maintenance, operation of air transport services with regards to catering waste) and manage any remaining waste in accordance with the waste hierarchy. (b) Measures are in place to manage and recycle waste in the end-of life of the fleet, including through decommissioning contractual agreements with aircraft recycling service providers, ensuring that measures are in place to segregate and treat components and materials in order to maximise recycling and reuse in accordance with the waste hierarchy and airworthiness regulations.
(5) Pollution prevention and control	(a) Compliance with Directive 2008/50 on ambient air quality; (b) Amendment 13 of Volume I (noise), Chapter 14, of Annex 16 to the Chicago Convention; (c) Amendment 10 of Volume II (engine emissions), Chapters 2 and 4, of Annex 16 to the Chicago Convention;

	(d) DNSH as set out in Appending C of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852 (e) Other relevant requirements referred to in Article 9(2) of the Regulation (EU) 2018/1139.
(6) Protection and restoration of biodiversity and ecosystems	N/A

Rationale

Transformative technology for even the smallest class of commercial aircraft is still more than a decade away. So-called zero emission aircraft, electric or powered by green hydrogen are expected to first become available for the regional market segment with up to 100 passengers and around 1000 nautical miles range. Airbus recently announced that the first zero-emission commercial aircraft could enter service by 2035. The Commission's sustainable and smart mobility strategy also has the objective that such aircraft will become ready for market by 2035. For aircraft with longer ranges and more seats, which account for the bulk of air transport and CO2 emissions, there is currently no reliable indication when such aircraft will be market ready.

Until then, incremental efficiency improvements of airframes and engines in combination with the use of sustainable aviation fuels (SAF) producing less CO2 over their life cycle than conventional jet fuel are the main mitigation options available to the sector. This means a substantial contribution as defined in Art. 10 (1) of the Taxonomy Regulation (EU) 2020/852 is currently out of reach. However, aviation can be included in the taxonomy as a transition activity pursuant to Art. 10 (2) to the extent that "it supports the transition to a climate-neutral economy consistent with a pathway to limit the temperature increase to 1,5°C above pre-industrial level". The objective is to contribute to mitigating GHG emissions from the sector before transformative technologies become market ready, ensuring a minimum aggregated emission reduction of 20% in the first decade.

Passenger and freight volumes in the EU and global aviation market have grown strongly during past decades. Efficiency improvements were insufficient to compensate for the growing demand which resulted in growing GHG emissions from the sector. The COVID 19 pandemic resulted in a strong reduction in demand, especially for air passenger transport. However, current forecasts predict a return to pre-crisis levels by 2024 with continued growth thereafter.

Therefore, screening criteria for aviation as a transition activity need to achieve three things: (1) incentivise the replacement of old, less efficient aircraft with new, more efficient ones without contributing to fleet expansion; (2) accelerate the development and market introduction of increasingly efficient aircraft without compromising the development of zero-exhaust CO2 emission breakthrough technologies; (3) incentivise the replacement of fossil jet fuel with sustainable aviation fuels, including the technical readiness of the aircraft fleet to operate with high blending ratios.

In response to this, the following screening criteria were agreed:

1) A **scrapping rule** requiring proof that an old, non-taxonomy compliant aircraft was decommissioned to make a new, more efficient one eligible. For aircraft manufacturers the equivalent requirement is that eligible aircraft cannot contribute to the expansion of the global fleet. This requirement will be verified by identifying the ratio of aircraft being retired versus those being delivered over 10 years, based on publicly available data. The average ratio is averaged over 10 years to ensure a more stable rate reflective of long term trends. This is against the backdrop of current market forecasts predicting that at least half of the new commercial aircraft ordered in the future will be for fleet expansion.

2) Aircraft **efficiency requirements** based on the ICAO new type (NT) CO2 standard to define which new aircraft can be considered as 'best-in-class' for the purpose of the taxonomy. This criterion is differentiated by three aircraft classes:

- Regional aircraft (strictly below 60 tonnes of maximum take-off mass (MTOM[588])

- Narrowbody aircraft (as of 60 and strictly below 150 MTOM)

- Widebody aircraft (above or equal to 150 MTOM)

[588] Maximum takeoff mass in metric tonnes

A margin has been added to these three categories to accurately reflect the best in class performance across current commercial aircraft types and variants.

3) The requirement for aircraft to be **100% sustainable aviation fuel certified** from the beginning of 2028 to give the assets included in the transition activity a long-term decarbonisation perspective. In practice, this will only make a difference if blends with more than 50% SAF are used in the future.

4) On the operator side, a **progressive increase in the use of SAF**. The percentages have been chosen to be above any mandatory blending requirements that could be introduced by the EU during the coming years This is to ensure taxonomy criteria go beyond what will be necessary for legal compliance.

5) Initial taxonomy compliant revenue of air passenger transport should take into account previous efforts to improve the energy performance of fleets but also ensure that fleet expansion and overall growth in CO2 emissions that has occured before the entry into force of the criteria is not considered as taxonomy compliant. This is why for a limited period of time (still to be determined) taxonomy compliant revenue can be determined by the portion of the fleet that meets NACE C30.3 requirements multiplied by a global average replacement ratio (total aircraft decommissioned over total aircraft delivered).

Due to the uncertainty involved, it was agreed not to define screening criteria for aviation as a transition activity for the time after 2032. However, this can be re-examined as part of the review defined in the Taxonomy Regulation (EU) 2020/852.

8.11 Air transportation ground handling operations

Description of the activity

Service activities incidental to air transportation [Ground-handling], – includes ground services activities at airports. And cargo handling, including loading and unloading of goods from aircraft.

The activities are classified under NACE codes H52.2.3, H52.2.4, H49.3.9 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

In particular the criteria refer to the following activities:

- vehicles for aircraft marshalling and other services within the apron;
- equipment for passenger boarding, including passenger shuttles, mobile steps;
- equipment for baggage and freight handling including belt loaders, baggage tractors, airport pallet trucks lower deck loaders, conveyor belt loaders, main deck loaders;
- equipment for catering including cool container dollies, excluding equipment with refrigeration units powered by an internal combustion engine;
- maintenance equipment including maintenance stands and platforms;
- pushback tugs
- de-icing equipment for aircraft and engine de-icing;
- snow ploughs and other snow clearance and surface de-icing equipment.
- non-autonomous taxiing

Substantial contribution to climate change mitigation
Ground handling vehicles' direct (tailpipe) CO2 emissions are zero. The propulsion of all ground handling devices comes from a zero-emissions motor.

Do no significant harm ('DNSH')	
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.
(3) Sustainable use and protection of water and marine resources	DNSH as set out in Appending B of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852. With regard to de-icing activities, measures are in place to ensure the necessary discharge controls at airport level, to reduce the environmental impact on watercourses. This could be done for example with the use of more environmentally sustainable chemicals, glycol recovery and surface water treatment.

(4) Transition to a Circular Economy	Measures are in place to manage waste, in accordance with the waste hierarchy, both in the use phase (maintenance) and the end-of-life of the fleet, including through reuse and recycling of batteries and electronics (in particular critical raw materials therein).
(5) Pollution, prevention and control	DNSH as set out in Appending C of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852. Air emissions from non-road mobile machinery. Emissions from these engines are regulated as of 1 January 2017 by the 'NRMM Regulation': Regulation (EU) 2016/1628 on requirements relating to gaseous and particulate pollutant emission limits and type-approval for internal combustion engines for non-road mobile machinery.
(6) Protection and restoration of biodiversity and ecosystems	With regard to de-icing activities, measures are in place to ensure the necessary discharge controls at airport level. This could be done for example with the use of more environmentally sustainable chemicals, glycol recovery and surface water treatment.

Rationale

While airport related emissions are estimated to represent only 2% to 5% of the global aviation emissions, airport operators are a critical interface between various aviation and non-aviation stakeholders. By actively reducing their emissions, they can act as a role model and also facilitate or even drive effective emissions management by these stakeholders. [ICAO ENV report 2019]

Ground-handling at airports, in particular the loading and unloading of aircraft (baggage, fuel, catering and cargo) and taxiing can generate greenhouse gas emissions. The technology to avoid such emissions does already exist, or is on the horizon, principally through the use of electrically powered handling equipment (loaders, baggage dollies, pushback tugs, electrical taxiing solutions etc.).

9. Restoration, Remediation

9.1 Conservation of habitats and ecosystems

Description of the activity

Conservation aiming at maintaining or improving the status and trends of terrestrial, freshwater and marine habitats, ecosystems and populations of related fauna and flora species as defined by the Convention on Biological Diversity (CBD). Includes the conservation of ecosystems, habitats and/or the maintenance and recovery of viable populations of species in their natural surroundings (in-situ conservation) by means of protected areas or other effective area-based conservation measures into wider land- and seascapes[589]. Includes conservation in natural, semi-natural and urban contexts as long as they serve a conservation objective as described above. Includes all types of areas under some kind of management for conservation purposes, whether formally administered or not[590].

The activity does not include conservation of components of biological diversity outside of their natural habitats (ex-situ conservation).

The activity has no dedicated NACE code but is partially covered under NACE codes (91.04) as referred to in the statistical classification of economic activities established by Regulation (EC) No 1893/2006. In addition, the activity relates to Class 6 of the statistical classification of environmental protection activities (CEPA) established by Regulation (EU) No 691/2011 of the European Parliament and of the Council.

Substantial contribution to protection and restoration of biodiversity and ecosystems

[589] The CBD defines other effective area-based conservation measures (OECM) as *´a geographically defined area other than a protected area, which is governed and managed in ways that achieve positive and sustained long-term outcomes for the in-situ conservation of biodiversity, with associated ecosystem functions and services and where applicable, cultural, spiritual, socio-economic, and other relevant values´*. Protected areas and other effective area-based conservation measures (cbd.int)

[590] Non-administered conservation areas are areas over which a recorded conservation interest has been secured but not administered by the competent authority.

All of the following criteria are fulfilled :

1. Conservation management plan

1.1 The activity takes place in an area that is subject to an area-based **Conservation Management Plan or an equivalent instrument**, as set out in national or international law or, where national or international regulation does not define a conservation management plan, as defined by the IUCN Green List Standard[591], the IUCN Guidelines for privately protected areas[592] and/or the CBD Guidance on protected areas and other effective areas-based conservation measures, as applicable to the specific context and nature of the area under conservation. The area-based conservation management plan can be stand-alone documents or be integrated into other national or local plans.

In particular, the area-based conservation management plan or the equivalent instrument covers the whole period considered necessary to achieve the specific conservation goals (see point a) and is based on scientific information to provide the following detailed elements:

a) Clear ecosystem and/or biodiversity related conservation goals that are ecologically representative and consistent with the national and international targets, and approved by the relevant competent authority (when required);

b) Clear description of the conservation strategies, measures and activities planned to reach the conservation goals;

c) Baseline of the ecosystems/habitats types concerned and biodiversity assets including their extent and distribution[593];

[591] The IUCN Green List of Protected and Conserved Areas Standard (IUCN Green List Standard) describes a set of seventeen CRITERIA categorised under four COMPONENTS, accompanied by 50 INDICATORS, for successful conservation in protected and conserved areas. It provides an international benchmark for quality that motivates improved performance and helps achieve conservation objectives. The global IUCN Green List Standard remains unchanged, until it is reviewed at least every five years (in accordance with the ISEAL Code). Global Standard | IUCN

[592] Mitchell, B.A., Stolton, S., Bezaury-Creel, J., Bingham, H.C., Cumming, T.L., Dudley, N., Fitzsimons, J.A., Malleret-King, D., Redford, K.H. and Solano, P. (2018). Guidelines for privately protected areas. Best Practice Protected Area Guidelines Series No. 29. Gland, Switzerland: IUCN. xii + 100pp. PAG-029-En.pdf (iucn.org)

[593] IUCN Red List of Ecosystem methodology is used for this purpose - Red List of Ecosystems | IUCN

d) definition of the protection status of the area (if any);

e) description of existing or planned human activities that may an impact on conservation objectives, such as hunting and fishing, agricultural, pastoral and forestry activities, industrial, mining, recreational services, scientific research and education activities, and commercial activities;

f) consideration of social issues (preservation of landscape and cultural heritage, consultation of stakeholders including participation of indigenous communities where relevant);

g) assessment of risks and threats including their mitigation, including a climate change vulnerability assessment and related adaptation measures[594];

h) continuous monitoring and measuring of performance against the defined goals, including a review of the conservation plan every **5 years** or less based on an adaptive approach allowing for the identification of corrective actions necessary to achieve planned results;

i) Alignment with the wider policy objectives set out in the EU environmental acquis[595], and/or any other relevant national law or targets established under the CBD.

1.2 In relation to points a) and b) of criterion 1.1 above, the conservation management plan or equivalent instrument indicates clearly the conservation status[596] of relevant habitats and/or species and aims at achieving **good condition**, where this is not already the case, over a clearly defined timeframe as defined by the following criteria[597]:

[594] See note 5

[595] This includes specifically the Habitats Directive (92/43/EEC), the Birds Directive (2009/147/EC), the Water Framework Directive (2000/60/EC), the Marine Strategy Framework Directive (2008/56/EC) and the Restoration law (under preparation).

[596] Conservation status is defined as: - in respect of a natural habitat, the sum of the influences acting on a natural habitat and its typical species that may affect its long-term natural distribution, structure and functions as well as the long-term survival of its typical species; - in respect of a species, the sum of the influences acting on the species concerned that may affect the long-term distribution and abundance of its populations (Art. 1 in Habitats Directive (92/43/EEC).

[597] Article 1(e) and (i) in Habitats Directive (92/43/EEC).

For each Habitat type

a) the conservation status of its typical species is favourable

b) the natural range and areas it covers within that range are stable or increasing;

c) the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future;

For each Species

d) population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats;

e) the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future;

f) there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

1.3 All DNSH criteria relevant to environmental objectives other than *´Protection and restoration of biodiversity and ecosystems´* are addressed in the conservation management plan or equivalent instrument.

2. Governance

2.1 All the elements necessary for the implementation of the area-based Conservation Management Plan are in place and defined in detail in a **Governance Strategy or an equivalent instrument (or in the conservation management plan itself)**, describing:

a) How the management structure ensures equitable governance, full accountability, reporting requirements and wide participation of all stakeholders involved.

b) Which working partnerships with appropriate organizations and institutions are or will be established to support the monitoring of conservation objectives and undertake research studies leading to an improved scientific understanding of the area.

c) How the scientific information required to determine and monitor the conservation status of the relevant habitats and species and the achievement or maintenance of

favourable conservation status is going to be gathered,used and shared (see criterion 1.2).

d) Which information/ awareness raising mechanisms are in place per target groups (e.g. private sector, policy makers, development institutions, community-based organizations, the youth, the media, and the general public).

2.2 At the beginning of the activity and **every two years** thereafter, the compliance with the conservation management plan or equivalent instrument, is controlled by either the relevant national competent authorities or by an independent third-party certifier such as a dedicated certification/accreditation scheme (VCA[598], IUCN Green List or other), at the request of national authorities or the operator of the activity. The independent third-party certifier may not have any conflict of interest with the owner or the funder, and may not be involved in the development or operation of the activity. In order to reduce costs, audits may be performed together with any forest certification, climate certification or other audit.

3. Business Plan

3.1 The current and future resourcing and funding needs required for the implementation of the area-based conservation management plan is documented in a dedicated **Business Plan or an equivalent instrument (or in the conservation management plan itself),** as defined by the Conservation Finance Alliance (CFA) [599]. The Business Plan defines clearly a time-bound target for financial self-reliance defined as the % of funds derived from direct and/or indirect market-based revenue generating mechanisms over the total yearly operating cost of the area (*Revenue from Market Mechanisms per year / Total Yearly Operating Costs x 100*), aiming at a decreasing reliance on public / grant funding.

4. Guarantee of permanence

4.1 The area on which the activity takes place is protected from conversion and deterioration for a minimum of 5 years beyond the period considered necessary to achieve the specific goals set in the Conservation Plan (criterion 1.1) by one of the following measures:

[598] Voluntary Conservation | Earthmind

[599] https://www.conservationfinance.info/business-planning-for-protected-areas

a) the area is classified as a protected area under any of the IUCN Categories[600] by national law and/or under an international convention to which the country is signatory.

b) the area is the subject to a long term public or private contractual agreement ensuring that it will remain a conservation area.

c) The area is destined to preservation in its natural state in a statutory land, freshwater or maritime use plan[601] approved by the competent authorities[602].

5. Additional minimum requirements

5.1 The conservation activity is **not implemented with the purpose of offsetting** the impact of another economic activity.

5.2 For all economic activities taking place in the conservation area the following requirements apply:

a) An Environmental Impact Assessment (EIA) or screening has been completed, for activities within the Union, in accordance with Directive 2011/92/EU as amended by Directive 2014/52/EU. For activities in third countries, an EIA has been completed in accordance with equivalent national provisions or international standards. Where an EIA has been carried out, the required mitigation and compensation measures for protecting the environment are implemented.

b) For sites/operations located in or near biodiversity-sensitive areas (including the Natura 2000 network of protected areas, UNESCO World Heritage sites and Key Biodiversity Areas, as well as other protected areas), an appropriate assessment, where applicable,

[600] Protected Area Categories | IUCN

[601] Only areas included under the EEZ of a sovereign country and over which the country has full jurisdiction.

[602] Member States shall endeavour, where they consider it necessary, in their land-use planning and development policies and, in particular, with a view to improving the ecological coherence of the Natura 2000 network, to encourage the management of features of the landscape which are of major importance for wild fauna and flora (Art. 10 in Habitats Directive (92/43/EEC).

has been conducted and based on its conclusions the necessary mitigation measures are implemented.

c) The introduction of invasive alien species is prevented and/or their spread is managed in accordance with Regulation (EU) No 1143/2014.

Do no significant harm ('DNSH')

(1) Climate change mitigation	The activity does not involve the degradation of land with high carbon stock[603].
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.
(3) Sustainable use and protection of water and marine resources	DNSH as set out in Appending B of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852. Environmental degradation risks related to preserving marine environment, in particular risk to the Good Environmental Status as defined in the Marine Strategy Framework Directive (Directive 2008/56/EC), are identified and addressed.
(4) Transition to a circular economy	N/A
(5) Pollution prevention and control	The use of pesticides is minimised and alternative approaches or techniques, which may include non-chemical alternatives to pesticides are favoured, in accordance with Directive 2009/128/EC, with exception

[603] Land with high-carbon stock means wetlands, including peatland, and continuously forested areas within the meaning of Article 29(4)(a), (b) and (c) of Directive (EU) 2018/200 .

	of occasions where the use of pesticides is needed to control outbreaks of pest and diseases. The activity minimises the use of fertilisers and does not use manure. The activity complies with Regulation (EU) 2019/1009 or national rules on fertilisers or soil improvers for agricultural use. Well documented and verifiable measures are taken to avoid the use of active ingredients that are listed in Annex I, part A, of Regulation (EU) 2019/1021[604], the Rotterdam Convention on the prior informed consent procedure for certain hazardous chemicals and pesticides in international trade, the Minamata Convention on Mercury, the Montreal Protocol on Substances that Deplete the Ozone Layer, and of active ingredients that are listed as classification Ia ('extremely hazardous') or Ib ('highly hazardous') in the WHO recommended Classification of Pesticides by Hazard[605]. The activity complies with the relevant national law on active ingredients.

Rationale

Substantial Contribution: Conservation of habitats and ecosystems refers to the planned management of a natural resources or of a particular ecosystem to maintain its biodiversity and/or to halt, reverse or slow-down the loss of biodiversity from impacts of exploitation, pollution etc. to ensure the future usability of the resource, resilience of communities, and ecosystem integrity. The activity by its nature is directly contributing to the environmental objective. Although the conservation objectives need to be clearly defined and specific targets quantified in the management plan of the conservation area, there are two main reasons that make the

[604] Which implements in the Union the Stockholm Convention on persistent organic pollutants ((OJ L 209, 31.7.2006, p. 3.).

[605] The WHO Recommended Classification of Pesticides by Hazard (version 2019), (version of [adoption date]: https://apps.who.int/iris/bitstream/handle/10665/332193/9789240005662-eng.pdf?ua=1).

use of impact, performance, best-in-class quantitative criteria unviable fir this activity in the context of the Taxonomy:

- Quantitative targets can be defined only in relation to a specific location, habitat type, species and conservation objective. Therefore, general targets applicable to all conservation activities cannot be defined.
- the performance of a conservation activity can only be measured over a time-span of several years.

As a result, the definition of criteria can only be process or practice based and, in particular, is focused on the **governance structure able to oversee the implementation of specific conservation management measures over an area of land/sea over a sufficiently long time-span** to ensure conservation objectives can be achieved. While not providing quantitative conservation targets, the criteria clearly indicate which indicators should be used for defining relevant targets in relation to the end-goal of achieving good ecosystem conditions (Conservation Management Plan) and for achieving financial self-reliance (Business Plan). The formal designation of the area as protected is not a requirement but it often facilitates the creation and funding of an adequate governance structure. IUCN classifies Protected Areas in different categories corresponding to different conservation approaches and governance structures. Nevertheless, areas which are not formally protected are considered within the scope of the taxonomy as long as they are under management for conservation purposes.

Some minimum requirements are included as a last set of criteria to ensure no harm to biodiversity elsewhere or in the conservation area itself. In particular, **biodiversity offsets** are explicitly excluded because they represent the ´last resort´ measures that can be taken to limit any negative impacts on biodiversity following the full application of the mitigation hierarchy. The mitigation hierarchy is a corner stone of impact assessment and is routinely applied in the context of Environmental Impact Assessment (EIA) to reduce the potential impact of projects. The practice is embedded and clearly mentioned in the EIA Directive and the Habitats Directive. Therefore, it seems obvious to associate offsetting to a DNSH requirement and, as such, not sufficient to determine a SC.

In relation to the requirements in art. 19 of the Taxonomy Regulation (EU) 2020/852:

- **Policy coherence**: the proposed criteria are aligned with international best practices and recommendations as defined by the Convention on Biological Diversity and the leading organisation in the areas of conservation (e.g. IUCN). In addition, they reflect the policy goals and specific targets of the EU Biodiversity Strategy 2030 for

conservation and the related Technical Note on Criteria and Guidance for Protected Areas Designations[606];

- **Environmental ambition and integrity**: the criteria advocate for a scientific approach to setting conservation objectives taking into account the specific nature and use (if any) of the conservation area and the related EU Policy. The process based requirements reflect the experience accumulated globally by practitioners, scientists and policymakers in Ecosystems/Biodiversity conservation;
- **Level playing field**: the proposed criteria are applicable to any kind of area-based conservation area regardless of their conservation regime and regardless of the specific conservation objectives of the area. The criteria focus on ensuring the management of the area is based on a solid governance structure that ensures long-term sustainability of the activity.
- **Usability of the criteria**: the criteria are based on the development of a dedicated governance strategy, business and management plan, which is common best practice. Verification by a third party at the start of the activity and regularly over its entire duration to ensure proper implementation can easily be organised though international organisations, national competent authorities or NGOs focused on conservation, depending on the conservation regime of the area.

DNSH: The criteria used reflect the standard wording used in the Appendixes to the Annex I of the first Climate Delegated Act supplementing Regulation (EU) 2020/852, with the exception of CCM, Water, PPC and Circular Economy.

- CCM: The main potential harm to mitigation could derive from a land conversion leading to reduction in the carbon stock. In the absence of clear regulatory reference in these area, this element is captured by criteria based on best practice considerations;
- Water: reference is added to the Marine Strategy Framework Directive and the need to maintain Good Environmental Status with the same wording used for the WFD.
- PPC: The wording is adopted from the activity the Climate DA Annex I - Restoration of Wetlands.

CE: Is not relevant to the conservation activity.

[606] Draft note protected areas v2 TC.pdf (europa.eu)

9.2 Restoration of ecosystems for protection and restoration of biodiversity and ecosystems

Description of the activity

Ecosystem restoration refers to a process or activity that, passively or actively, assists the recovery of an ecosystem resulting in improved physical and chemical conditions, structure, functionality, species composition and resilience or ecosystem status. Ecosystem restoration includes the re-creation of an ecosystem ex-novo. It includes restoration in natural, semi-natural and urban contexts as long as they serve a restoration objective as described above.

The activity has no dedicated NACE code but is partially covered under NACE code 91.04 (Botanical and zoological gardens and nature reserves activities), as referred to in the statistical classification of economic activities established by Regulation (EC) No 1893/2006. In addition, the activity relates to Class 6 of the statistical classification of environmental protection activities (CEPA) established by Regulation (EU) No 691/2011 of the European Parliament and of the Council.

Substantial contribution to protection and restoration of biodiversity and ecosystems

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All of the following criteria are fulfilled :

1. Restoration plan

1.1 The activity takes place in an area that is subject to an area-based **Restoration Plan or an equivalent instrument**, as set out in Restoration law (under preparation) and/or any other relevant national law[607] or, where national legislation does not define a restoration plan, as defined by the IUCN and the Society for Ecological Restoration (SER)[608], as applicable to the specific context and nature of the area under restoration. The restoration plan can be stand-alone documents or be integrated into other national or local plans.

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[607] Nature restoration is already partially required from the Member States in existing EU legislation, notably the EU Birds Directive (2009/147/EC), Habitats Directive (92/43/EEC), Water Framework Directive (2000/60/EC), Floods Directive (2007/60/EC) and Marine Strategy Framework Directive (2008/56/EC).

[608] Ecosystem Restoration | IUCN

In particular, the restoration plan or the equivalent instrument covers the whole period considered necessary to achieve the specific restoration goals (see point a) and is based on scientific information to provide the following detailed elements:

a) Clear ecosystem and social time-bound restoration goals that are representative and consistent with the national / international targets and take into account landscape level considerations;

b) Clear description of the passive and/or active restoration approaches, treatments and activities planned to reach the restoration goals;

c) Native reference ecosystems or models characterised on the base of key ecosystem attributes[609], to be used as target of the restoration activity biotic and physical, aquatic and terrestrial aspects;

d) Baseline of the ecosystems/habitats types documenting the causes, intensity, and extent of degradation, and describing the effects of degradation on biota and physical environment concerned with an indication of what is considered native, non-native, invasive or at risk[610];

e) definition of the protection status of the area (if any);

f) description of existing or planned human activities[611] that have impacted in the past and can still impact on restoration objectives in the future, including ways to eliminate or mitigate them;

g) consideration of social issues (consultation of stakeholders including participation of indigenous communities where relevant);

[609] The 6 key ecosystems attributes for restoration as defined by the Society for Ecological Restoration are: Absence of threats, Physical conditions, Species composition, Structural diversity, Ecosystem function, External exchanges, International Standards for the Practice of Ecological Restoration - Society for Ecological Restoration (ser.org)

[610] IUCN Red List of Ecosystem methodology is used for this purpose - Red List of Ecosystems | IUCN

[611] Human activities of particular relevance include hunting and fishing, agricultural, pastoral and forestry activities, industrial, mining, recreational services, scientific research and education activities, and commercial activities.

h) assessment of risks and threats including their mitigation, including a climate change vulnerability assessment and related adaptation measures;

i) continuous monitoring and measuring of performance against the defined goals, including a review of the restoration plan every **5 years** or less based on an adaptive approach allowing for the identification of corrective actions necessary to achieve planned results;

j) proposed long–term handover strategy for maintenance after restoration completion to ensure that the area does not regress into a degraded state.

1.2 In relation to points a), b) and c) of criterion 1.1 above, the restoration plan or equivalent instrument indicates clearly the desired conservation status[612] of relevant habitats and/or species at the end of the restoration process taking into account:

a) the nature restoration targets defined by the EU Restoration law (under preparation), national law or by other relevant thematic policy documents[613].

b) the need for restoration activity to regenerate or reinforce all relevant ecosystem functions so that the restoration can bring multiple benefits[614].

1.3 All DNSH criteria relevant to environmental objectives other than *´Protection and restoration of biodiversity and ecosystems´* are addressed in the restoration plan or equivalent instrument.

2. Governance

[612] Conservation status is defined as: - in respect of a natural habitat, the sum of the influences acting on a natural habitat and its typical species that may affect its long-term natural distribution, structure and functions as well as the long-term survival of its typical species; - in respect of a species, the sum of the influences acting on the species concerned that may affect the long-term distribution and abundance of its populations (Art. 1 in Habitats Directive (92/43/EEC).

[613] In the context of the EU these include the Farm to Fork Strategy, EU Soil Thematic Strategy, EU Forest Strategy, Urban Greening Plans, Zero Pollution Action Plan for Air, Water and Soil. Outside of the EU reference is made to the goals defined in the context of the UN Decade for Ecosystems restoration - https://www.decadeonrestoration.org/

[614] The definition of targets for the restoration of ecosystems to good condition takes into account all important ecosystem functions so that the restoration can bring multiple benefits, such as climate regulation, water regulation, soil health, pollination and disaster prevention and protection.

2.1 All the elements necessary for the implementation of the Restoration Plan are in place and defined in detail in a **Governance Strategy or an equivalent instrument (or in the restoration plan itself)**, describing:

a) How the management structure ensures equitable governance, full accountability, reporting requirements and wide participation of all stakeholders involved.

b) How the future resourcing and funding needs required for the implementation of the restoration plan is guaranteed.

c) Which working partnerships with appropriate organizations and institutions are or will be established to support the monitoring of restoration objectives and undertake research studies leading to an improved scientific understanding of the area.

d) How the scientific information required to determine and monitor the relevant habitats and species and the achievement of the desired restoration goals is going to be gathered, used and shared (see criterion 1.2).

e) Which information/ awareness raising mechanisms are in place per target groups (e.g. private sector, policy makers, development institutions, community-based organizations, the youth, the media, and the general public).

2.2 At the beginning of the activity and **every two years** thereafter, the compliance with the restoration plan or equivalent instrument, is controlled by either the relevant national competent authorities or by an independent third-party certifier such as a dedicated certification/accreditation scheme (VCA[615], IUCN Green List or other), at the request of national authorities or the operator of the activity. The independent third-party certifier is not in any conflict of interest with the owner or the funder, and is not involved in the development or operation of the activity. In order to reduce costs, audits may be performed together with any forest certification, climate certification or other audit.

3. Guarantee of permanence

3.1 The area on which the activity takes place is protected from conversion to other land uses and deterioration for a minimum of 5 years beyond the period considered necessary to achieve

[615] Voluntary Conservation | Earthmind

the specific goals set in the Restoration Plan or equivalent (criterion 1.1) by one of the following measures:

a) the area is classified as a protected area under any of the IUCN Categories[616] by national law and/or under an international convention to which the country is signatory.

b) the area is the subject to a long term public or private contractual agreement ensuring that it will remain a restoration area.

c) The area is destined to restoration in a statutory land, freshwater or maritime use plan approved by the competent authorities[617].

4. Additional minimum requirements

4.1 The restoration activity is **not implemented with the purpose of offsetting** the impact of another economic activity.

4.2 For all economic activities taking place in the restoration area the following requirements apply:

a) An Environmental Impact Assessment (EIA) or screening has been completed, for activities within the Union, in accordance with Directive 2011/92/EU as amended by Directive 2014/52/EU. For activities in third countries, an EIA has been completed in accordance with equivalent national provisions or international standards. Where an EIA has been carried out, the required mitigation and compensation measures for protecting the environment are implemented.

b) For sites/operations located in or near biodiversity-sensitive areas (including the Natura 2000 network of protected areas, UNESCO World Heritage sites and Key Biodiversity Areas, as well as other protected areas), an appropriate assessment, where applicable,

[616] Protected Area Categories | IUCN

[617] Member States shall endeavour, where they consider it necessary, in their land-use planning and development policies and, in particular, with a view to improving the ecological coherence of the Natura 2000 network, to encourage the management of features of the landscape which are of major importance for wild fauna and flora (Art. 10 in Habitats Directive (92/43/EEC).

has been conducted and based on its conclusions the necessary mitigation measures are implemented.

c) The introduction of invasive alien species is prevented and/or their spread is managed in accordance with Regulation (EU) No 1143/2014.

Do no significant harm ('DNSH')

(1) Climate change mitigation	The activity does not involve the degradation of land with high carbon stock[618].
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.
(3) Sustainable use and protection of water and marine resources	DNSH as set out in Appending B of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852. Environmental degradation risks related to preserving marine environment, in particular risk to the Good Environmental Status as defined in the Marine Strategy Framework Directive (Directive 2008/56/EC), are identified and addressed.
(4) Transition to a circular economy	N/A

[618] Land with high-carbon stock means wetlands, including peatland, and continuously forested areas within the meaning of Article 29(4)(a), (b) and (c) of Directive (EU) 2018/200 .

(5) Pollution prevention and control	The use of pesticides is minimised and alternative approaches or techniques, which may include non-chemical alternatives to pesticides are favoured, in accordance with Directive 2009/128/EC, with exception of occasions where the use of pesticides is needed to control outbreaks of pest and diseases. The activity minimises the use of fertilisers and does not use manure. The activity complies with Regulation (EU) 2019/1009 or national rules on fertilisers or soil improvers for agricultural use. Well documented and verifiable measures are taken to avoid the use of active ingredients that are listed in Annex I, part A, of Regulation (EU) 2019/1021[619], the Rotterdam Convention on the prior informed consent procedure for certain hazardous chemicals and pesticides in international trade, the Minamata Convention on Mercury, the Montreal Protocol on Substances that Deplete the Ozone Layer, and of active ingredients that are listed as classification Ia ('extremely hazardous') or Ib ('highly hazardous') in the WHO recommended Classification of Pesticides by Hazard[620]. The activity complies with the relevant national law on active ingredients.

Rationale

Substantial Contribution: Ecosystem restoration is the process of passively or actively assisting the recovery of an ecosystem that has been degraded, damaged or destroyed. The activity by its nature is directly contributing to the environmental objective.

Although the restoration goals need to be clearly defined and specific targets quantified in the restoration plan of the area defined under criterion 1, there are two main reasons that make

[619] Which implements in the Union the Stockholm Convention on persistent organic pollutants ((OJ L 209, 31.7.2006, p. 3.).

[620] The WHO Recommended Classification of Pesticides by Hazard (version 2019), (version of [adoption date]: https://apps.who.int/iris/bitstream/handle/10665/332193/9789240005662-eng.pdf?ua=1).

the use of impact, performance, best-in-class quantitative criteria unviable for this activity in the context of the Taxonomy:

- Quantitative targets can be defined only in relation to a specific location, habitat type, species and restoration objective. Therefore, general targets applicable to all restoration activities cannot be defined.

- the performance of a restoration activity can only be measured over a time-span of several years.

As a result, the definition of criteria can only be process or practice based and, in particular, is focused on the **governance structure able to oversee the implementation of specific restoration measures over an area of land/sea over a sufficiently long time-span** to ensure conservation objectives can be achieved. While not providing quantitative restoration targets, the criteria clearly indicate which indicators should be used for defining relevant targets in relation to the desired end-goal of the restoration activity. The formal designation of the area as protected is not a requirement but it often facilitates the creation and funding of an adequate governance structure. IUCN classifies Protected Areas in different categories corresponding to different conservation approaches and governance structures. Nevertheless, areas which are not formally protected are considered within the scope of the taxonomy as long as they are under management for restoration purposes.

Some minimum requirements are included as a last set of criteria to ensure no harm to biodiversity elsewhere or in the restoration area itself. In particular, **biodiversity offsets** are explicitly excluded because they represent the ´last resort´ measures that can be taken to limit any negative impacts on biodiversity following the full application of the mitigation hierarchy. The mitigation hierarchy is a corner stone of impact assessment and is routinely applied in the context of Environmental Impact Assessment (EIA) to reduce the potential impact of projects. The practice is embedded and clearly mentioned in the EIA Directive and the Habitats Directive. Therefore, it seems obvious to associate offsetting to a DNSH requirement and, as such, not sufficient to determine a SC.

In relation to the requirements in art. 19 of the Taxonomy Regulation (EU) 2020/852:

- **Policy coherence**: the proposed criteria are aligned with international best practices and recommendations as defined by the Convention on Biological Diversity, the and

the UN Decade for Ecosystem Restoration[621]and the leading organisations in the areas of restoration (e.g. SER, IUCN). In addition, they reflect the policy goals and specific targets of the EU Biodiversity Strategy 2030 for restoration;

- **Environmental ambition and integrity**: the criteria advocate for a scientific approach to setting restoration objectives taking into account the specific nature and use (if any) of the restoration area and the related EU Policy. The process based requirements reflect the experience accumulated globally by practitioners, scientists and policymakers in Ecosystems/Biodiversity restoration;

- **Level playing field**: the proposed criteria are applicable to any kind of area-based restoration area regardless of their conservation regime and regardless of the specific restoration objectives of the area. The criteria focus on ensuring the management of the area is based on a solid governance structure that ensures long-term sustainability of the activity.

- **Usability of the criteria**: the criteria are based on the development of a dedicated restoration plan underpinned by a governance strategy and, which is common best practice. Verification by a third party at the start of the activity and regularly over its entire duration to ensure proper implementation can easily be organised though international organisations, national competent authorities or NGOs focused on biodiversity conservation or restoration, depending on the conservation regime of the area.

DNSH: The criteria used reflect the standard wording used in the Appendixes to the Annex I to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852, with the exception of Climate Change Mitigation, Water, PPC and Circular Economy.

- Climate Change Mitigation: The main potential harm to mitigation could derive from a land conversion leading to reduction in the carbon stock. In the absence of clear regulatory reference in these area, this element is captured by criteria based on best practice considerations;

[621] https://www.decadeonrestoration.org/

- Water: reference is added to the Marine Strategy Framework Directive and the need to maintain Good Environmental Status with the same wording used for the WFD.

- PPC: The wording is adopted from the activity the DA Annex I - Restoration of Wetlands.

CE: Is not relevant to the restoration activity.

9.3 Restoration of ecosystems for climate change adaptation

Description of the activity

Ecosystem restoration refers to a process or activity that, passively or actively, assists the recovery of an ecosystem resulting in improved physical and chemical conditions, structure, functionality, species composition, resilience or ecosystem status. Ecosystem restoration includes the re-creation of an ecosystem ex-novo.

It includes restoration in natural, semi-natural and urban contexts as long as they serve a restoration objective as described above.

The activity has no dedicated NACE code but is partially covered under NACE code 91.04 (Botanical and zoological gardens and nature reserves activities), as referred to in the statistical classification of economic activities established by Regulation (EC) No 1893/2006. In addition, the activity relates to Class 6 of the statistical classification of environmental protection activities (CEPA) established by Regulation (EU) No 691/2011 of the European Parliament and of the Council.

The activity is an enabling activity as referred to in Article 11(1), point (b), of Regulation (EU) 2020/852 where it meets the technical screening criteria set out in this section.

This activity excludes item 2.1 Restoration of wetlands from Annex II to the Commission Delegated Regulation (EU) …/... supplementing Regulation (EU) 2020/852.

Substantial contribution to climate change adaptation

1. The economic activity has implemented physical and non-physical solutions ('adaptation solutions') that substantially reduce the most important physical climate risks that are material to that activity.

2 The physical climate risks that are material to the activity have been identified from those listed in Appendix A to Annex II of the Delegated Act[622] by performing a robust climate risk and vulnerability assessment with the following steps:

(a) screening of the activity to identify which physical climate risks from the list in Appendix A to Annex II of the Delegated Act may affect the performance of the economic activity during its expected lifetime;

(b) where the activity is assessed to be at risk from one or more of the physical climate risks listed in Appendix A to Annex II of the Delegated Act, a climate risk and vulnerability assessment to assess the materiality of the physical climate risks on the economic activity;

(c) an assessment of adaptation solutions that can reduce the identified physical climate risk.

The climate risk and vulnerability assessment is proportionate to the scale of the activity and its expected lifespan, such that:

(a) for activities with an expected lifespan of less than 10 years, the assessment is performed, at least by using climate projections at the smallest appropriate scale;

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[622] COMMISSION DELEGATED REGULATION (EU) …/... supplementing Regulation (EU) 2020/852 of the European Parliament and of the

Council by establishing the technical screening criteria for determining the conditions under which an economic activity qualifies as

contributing substantially to climate change mitigation or climate change adaptation and for determining whether that economic activity

causes no significant harm to any of the other environmental objectives-C/2021/2800 final

(b) for all other activities, the assessment is performed using the highest available resolution, state of-the-art climate projections across the existing range of future scenarios[623] consistent with the expected lifetime of the activity, including, at least, 10 to 30 years climate projections scenarios for major investments.

3. The climate projections and assessment of impacts are based on best practice and available guidance and take into account the state-of-the-art science for vulnerability and risk analysis and related methodologies in line with the most recent Intergovernmental Panel on Climate Change reports[624], scientific peer-reviewed publications and open source[625] or paying models.

4.The adaptation solutions implemented:

(a) do not adversely affect the adaptation efforts or the level of resilience to physical climate risks of other people, of nature, of cultural heritage, of assets and of other economic activities;

(b) favour nature-based solutions[626] or rely on blue or green infrastructure[627] to the extent possible;

(c) are consistent with local, sectoral, regional or national adaptation plans and strategies;

[623] Future scenarios include Intergovernmental Panel on Climate Change representative concentration pathways RCP2.6, RCP4.5, RCP6.0

and RCP8.5.

[624] Assessments Reports on Climate Change: Impacts, Adaptation and Vulnerability, published periodically by the Intergovernmental Panel on Climate Change (IPCC), the United Nations body for assessing the science related to climate change produces, https://www.ipcc.ch/reports/.

[625] Such as Copernicus services managed by the European Commission.

[626] Nature-based solutions are defined as 'solutions that are inspired and supported by nature, which are cost-effective, simultaneously provide environmental, social and economic benefits and help build resilience. Such solutions bring more, and more diverse, nature and natural features and processes into cities, landscapes and seascapes, through locally adapted, resource-efficient and systemic interventions'. Therefore, nature-based solutions benefit biodiversity and support the delivery of a range of ecosystem services (version of [adoption date]: https://ec.europa.eu/info/research-and-innovation/research-area/environment/nature-based-solutions_en/).

[627] See Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Green Infrastructure (GI) — Enhancing Europe's Natural Capital (COM/2013/0249 final).

(d) are monitored and measured against pre-defined indicators and remedial action is considered where those indicators are not met;

(e) where the solution implemented is physical and consists in an activity for which technical screening criteria have been specified in this Annex, the solution complies with the do no significant harm technical screening criteria for that activity.

5. In order for an activity to be considered as an enabling activity as referred to in Article 11(1), point (b), of Regulation (EU) 2020/852, the economic operator demonstrates, through an assessment of current and future climate risks, including uncertainty and based on robust data, that the activity provides a technology, product, service, information, or practice, or promotes their uses with one of the following primary objectives:

(a) increasing the level of resilience to physical climate risks of other people, of nature, of cultural heritage, of assets and of other economic activities;

(b) contributing to adaptation efforts of other people, of nature, of cultural heritage, of assets and of other economic activities.

Do no significant harm ('DNSH')

(1) Climate change mitigation	The activity does not involve the degradation of land with high carbon stock[628].
(3) Sustainable use and protection of water and marine resources	DNSH as set out in Appending B of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852. Where relevant, environmental degradation risks related to preserving marine environment are identified and addressed with the aim of

([628]) Land with high-carbon stock means wetlands, including peatland, and continuously forested areas within the meaning of Article 29(4)(a), (b) and (c) of Directive (EU) 2018/200 .

	achieving good environmental status as defined in Article 2, point (21), of Regulation (EU) 2020/852, in accordance with Directive 2008/56/EC.
(4) Transition to a circular economy	At least 70 % (by weight) of the non-hazardous construction, demolition or other waste materials (excluding naturally occurring material defined in category 17 05 04 in the European List of Waste established by Decision 2000/532/EC) generated on the construction site is prepared for reuse, recycling and other material recovery, including backfilling operations using waste to substitute other materials, in accordance with the waste hierarchy.
(5) Pollution prevention and control	The use of pesticides is minimised and alternative approaches or techniques, which may include non-chemical alternatives to pesticides are favoured, in accordance with Directive 2009/128/EC, with exception of occasions where the use of pesticides is needed to control outbreaks of pest and diseases The activity minimises the use of fertilisers and does not use manure. Well documented and verifiable measures are taken to avoid the use of active ingredients that are listed in Annex I, part A, of Regulation (EU) 2019/1021([629]), the Rotterdam Convention on the prior informed consent procedure for certain hazardous chemicals and pesticides in international trade, the Minamata Convention on Mercury, the Montreal Protocol on Substances that Deplete the Ozone Layer, and of active ingredients that are listed as classification Ia ('extremely hazardous') or Ib ('highly hazardous') in the WHO recommended Classification of Pesticides by Hazard([630]).

([629]) Which implements in the Union the Stockholm Convention on persistent organic pollutants (OJ L 209, 31.7.2006, p. 3.).

([630]) The WHO Recommended Classification of Pesticides by Hazard (version 2019), (version of [adoption date]: https://apps.who.int/iris/bitstream/handle/10665/332193/9789240005662-eng.pdf?ua=1).

	The activity complies with relevant national implementing law on active ingredients, including the Regulation (EU) 2019/1009. Pollution of water and soil is prevented and cleaning up measures are undertaken when pollution occurs.
(6) Protection and restoration of biodiversity and ecosystems	In areas designated by the national competent authority for conservation or in habitats that are protected, the activity is in accordance with the conservation objectives for those areas. There is no conversion of habitats specifically sensitive to biodiversity loss or with high conservation value, or of areas set aside for the restoration of such habitats in accordance with national law. The restoration plan referred to in the technical screening criteria for substantial contribution includes provisions for maintaining and possibly enhancing biodiversity in accordance with national and local provisions, including the following: (a) ensuring the good conservation status of habitat and species, maintenance of typical habitat species; (b) excluding the use or release of invasive species in accordance with Regulation (EU) No 1143/2014.

Rationale

Restoration (for the environmental objective Adaptation as significant contribution) is focussing on the potential to provide certain ecosystem functions and increase the resilience of the restored ecosystem itself and of the economic activities where it is an enabling activity for. The focus should be on the role of the ecosystem restoration as an enabling activity. However, the restoration project itself should also be adapted to climate change. As a principle, this template does not define which ecosystems are to be restored. All ecosystems are eligible as long as the purpose of is to increase resilience and maintain or increase the potential to deliver certain ecosystem services.

The SC criteria for adaptation for activities that need to be regarded as both adapted and enabling in TEG recommendations and in the 1st Delegated Act follow process-based approach, which is likewise deemed to be the most suitable.

The restoration of wetlands as an economic activity in the DA1 was used as a basis to develop this template.

For the DNSH, the description of the DNSH in the DA1 for the restoration of wetlands was used as a basis to describe the DNSH for the restoration of ecosystems. Changes were made to bring it in line with the DNSH for the activities remediation of ecosystems and conservation of ecosystems (major changes for the objectives CE).

9.4 Remediation activities enabling restoration of waterbodies

Description of the activity

This activity includes:

- decontamination of soils and groundwater at the place of pollution, either in situ or ex situ, using e.g. mechanical, chemical or biological methods
- decontamination of industrial plants or sites
- decontamination and cleaning up of surface water (and its shores) following accidental pollution, e.g. through collection of pollutants or through chemical or biological methods;
- cleaning up oil spills and other pollutions on/in:
    - Surface water (as defined in the WFD):
        - Rivers
        - Lakes
        - Coastal waters
        - Transitional waters
    - Groundwater (as defined in the Water Framework Directive – WFD)
    - Marine water (as defined in the Marine Strategy Framework Directive – MSFD)
    - Sediments (for all surface water types)
    - Aquatic ecosystems
    - Buildings
    - Soil
    - Terrestrial ecosystems
- asbestos, lead paint, and other toxic material abatement

- other specialised pollution-control activities
- clean-up after disasters from natural hazards (flooding, earthquake etc.)
- removal of surface sealing and concreting
- remediation of old mining sites/legacies not associated with extraction revenues.

In addition, it includes all ancillary enabling activities that are directly necessary to prepare, plan and follow-up on the decontamination activity itself, for example:

- Surveying activities
- Sampling of soil, water, sediment, biota or other materials
- Laboratory analysis of samples to identify the nature and concentration of pollutants
- Demolition of contaminated buildings or other structures, and dismantling large-scale machinery and equipment (i.e. decommissioning)
- Earth moving/dredging: excavation, landfilling, levelling and any other activities necessary to operate the decontamination
- Control, monitoring and maintenance activities in the after-care phase

This activity excludes:

- purification of water for water supply purposes
- treatment of waste water
- treatment and disposal of non-hazardous waste and hazardous waste other than those generated during the remediation activity itself
- morphological remediation
- remediation of legally non-conforming landfills and abandoned or illegal waste dumps
- emergency Services
- decontamination of nuclear plants or sites
- remediation activity undertaken to comply with the Environmental Liability Directive (2004/35/CE)

This activity is classified as several NACE codes (39, 33.22, 43.11, 43.12, 71.12, 71.20, 74.90, 81.30) according to the statistical classification of economic activities established by Regulation (EC) No.1893/2006.

An activity in this category is an enabling activity in accordance with Article 12(1), point (e), of Regulation (EU) 2020/852 where it complies with the technical screening criteria set out in this Section.

Substantial contribution to sustainable use and protection of water and marine resources

The activity fulfils cumulatively all criteria below:

1 Remediation measures : All criteria below are fulfilled:

1.1. The relevant contaminants are removed, controlled, contained and/or diminished using mechanical, chemical, biological or other methods so that the contaminated area (land, water body or other), taking into account its approved future use of the area, no longer poses any significant risk of adversely affecting human health and the environment[631], as defined by:

a. national standards established to implement the provisions of

- Directive 2000/60/EC and EU standards established under Directive 2000/60/EC[632] or
- Directive 2008/56/EC[633,] in particular by descriptors 8 and 9 as set out in Commission Decision (EU) 2017/848 in relation to the relevant criteria and methodological standards for those descriptors,

OR, where these standards are not available,

b. a risk-assessment taking into account the characteristic and the extent of the impacted area (land, water body or other), the type, properties (persistence,

[631] Directive 2004/35/CE on environmental liability with regard to the prevention and remedying of environmental damage, Annex II, point 2.

[632] EU Environmental Quality Standards set under the Environmental Quality standards Directive 2008/105/EC, as amended (surface waters) and under the Groundwater directive 2006/118/EC (groundwater chemical status)

[633] Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive)

mobility and toxicity) and concentration of the substances, preparations, organisms or micro- organisms, possible migration pathways and the probability of dispersion[634],[635].

1.2. The remediation activity is conducted in line with best industry practice and including all of the following elements:

a. The original polluting sources are removed permanently before any remediation activity is undertaken (except long-range transboundary air pollution);

b. The exact location, type and extension of the contaminated area is well defined based on site-specific physical, chemical and/or microbiological data collection and analysis. Given the varied nature of pollutants and status elements, a range of techniques and methodologies to estimate and measure the condition and the adverse changes of water bodies may be applied.[636]

c. The remedial options are analysed in line with Annex II of EU Directive 2004/35/CE[637] or 'EN ISO 18504:2017 Soil quality – sustainable remediation' and

[634] Directive 2004/35/CE on environmental liability with regard to the prevention and remedying of environmental damage, Annex II, point 2.

[635] For remediation activities outside the EU: Unless more stringent standards are mandatory under national legislation, the UNEP Guidance on the management of contaminated sites (UNEP/MC/COP.3/8/Rev.1) - Guidance_Contaminated_Sites_EN.pdf (mercuryconvention.org) shall be applied.

[636] These techniques and methodologies include chemical analyses, habitat evaluation, toxicity measurements and bio-indices, for instance. Existing work done for purposes of classification and monitoring under the Water Framework Directive should be taken into account when estimating the baseline condition. Where no monitoring data exist for purposes of estimating the baseline condition of the areas of water adversely affected, it may be possible to extrapolate from data available for other similar areas of water, or from general reference sources.

Source: European Commission (2021): Guidelines providing a common understanding of the term 'environmental damage' as defined in Article 2 of Directive 2004/35/EC of the European Parliament and of the Council on environmental liability with regard to the prevention and remedying of environmental damage. COMMISSION NOTICE (2021/C 118/01)

[637] Directive 2004/35/CE on environmental liability with regard to the prevention and remedying of environmental damage, Annex II, point 1.3.1.

the most suitable remedial measures are defined in a dedicated remediation plan, including monitoring requirements.

d. Any hazardous and non-hazardous waste extracted or otherwise produced by the remediation activity is subject to appropriate collection, transports, treatment, recovery and/or disposal by an authorized operator, in accordance with legal requirements;

e. Remediation methods do not include reducing pollutant concentrations through dilution or watering down, unless a full justification, for reason other than cost considerations, is provided in the remediation plan.

f. Where appropriate, remediation plan must assess the risk of spreading invasive species, based both on likely occurrence and on actual site survey, and adopt appropriate mitigation measures

g. Control, monitoring or maintenance activities in the after-care phase of at least 10 years

1.3. The remediation and pollution monitoring plan is approved by the competent authority following consultation with local stakeholders;

1.4. The remediation activity is not undertaken as an obligation to comply with the Environmental Liability Directive (2004/35/CE).

2 Restoration and conservation measures

Following the remediation activity, a restoration activity is carried out in the area of the remediated water body and, if applicable, its catchment area. All criteria below are fulfilled:

2.1. A restoration plan is established and approved by a competent authority.

2.2. The restoration activity implements appropriate measures in order to contribute to achieve:

a. at least a good ecological status/potential and a good chemical status for surface water bodies in accordance with the Directive 2000/60/EC

b. OR at least a good quantitative status and a good chemical status for groundwater bodies in accordance with the Directive 2000/60/EC

c. OR at least a good environmental status for marine water and marine environment in accordance with Directive 2008/56/EC

3 Further economic use of the remediated water body

All criteria below are fulfilled:

3.1. Any further economic use of the water body beyond restoration/conservation purposes is in accordance with the targets and criteria set out in the restoration plan and does not cause any deterioration of the water body as set out under the Water Framework Directive (2000/60/EC) and its daughter Directives[638] and/or the Marine Strategy Framework Directive (2008/56/EC).

3.2. For all economic activities taking place in the remediated area or having impact on the remediated water body the following requirements apply:

a. Environmental degradation risks related to preserving water quality and avoiding water stress are identified and addressed with the aim of achieving and maintaining good ecological, chemical and quantitative status and a water use and protection management plan is developed for the potentially affected water body or bodies, in consultation with relevant stakeholders, in accordance with Directive 2000/60/EC of the European Parliament and of the Council[639].

[638] Environmental Quality Standards Directive (2008/105/EC); Groundwater Directive (2006/118/EC)

[639] Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy (OJ L 327, 22.12.2000, p. 1).

For activities in third countries, in accordance with applicable national law or international standards which pursue equivalent objectives of good water status and good ecological potential, through equivalent procedural and substantive rules, i.e. a water use and protection management plan developed in consultation with relevant stakeholders which ensures that 1) the impact of the activities on the identified status or ecological potential of potentially affected water body or bodies is assessed and 2) deterioration or prevention of good status/ecological potential is avoided or, where this is not possible, 3) justified by the lack of better environmental alternatives which are not disproportionately costly/technically unfeasible, and all practicable steps are taken to mitigate the adverse impact on the status of the body of water.

b. Where an Environmental Impact Assessment is carried out in accordance with Directive 2011/92/EU of the European Parliament and of the Council and includes an assessment of the impact on water in accordance with Directive 2000/60/EC, no additional assessment of impact on water is required, provided the risks identified have been addressed.

c. Extraction of water is minimised according to best practices for the respective further use case

4 Guarantee of permanence

All criteria below are fulfilled:

4.1. The water body and/or land area on which the activity takes place is protected from conversion and deterioration for a minimum of 5 years beyond the period considered necessary to achieve the goals set in the Restoration Plan or equivalent instrument as a result of at least one of the following:

a. The use of the water body is defined in the River Basin Management Plan or in accordance with Directive 2000/60/EC or the Marine Strategy in accordance with Directive 2008/56/EC;

b. the water body and/or its catchment area is classified as a protected area or is part of a protected area under any of the IUCN Categories[640] by national law and/or under an international convention to which the country is signatory;

c. the use of the water body is the subject of any long-term legal or contractual guarantee;

d. the use of the waterbody and the surrounding areas is defined in a statutory land use plan approved by the competent authorities.

4.2. The owner of the area, where the activity takes place, commits to the public authority - as part of the restoration or conservation plan - that future updates to the respective

[640] Protected Area Categories | IUCN

plan will continue to keep the at least good ecological, chemical, quantitative and environmental status as set out in Directive 2000/60/EC or in Directive 2008/56/EC.

5 Audit

Within two years after the completion of the remediation activity and every 3 years thereafter, the compliance of the activity with the criteria 1, 2, 3 and 4 above as well as the compliance with the DNSH criteria are verified by either of the following:

5.1. the relevant national competent authorities;

5.2. OR an independent third-party certifier, at the request of national authorities or the operator of the activity.

The independent third-party verifier must not have any conflict of interest with the owner or the funder, and may not be involved in the development or operation of the activity.

In order to reduce costs, audits may be performed together with the progress reports according to the Directive 2000/60/EC or Directive 2008/56/EC.

Do no significant harm ('DNSH')

(1) Climate change mitigation	The activity does not involve the degradation of land, marine and inland freshwaters with high carbon stock[641]. Measures to reduce scope 1 and scope 2 GHG emissions of the full removal and/or treatment process are included in the remediation plan.
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852

[641] Land with high-carbon stock means wetlands, including peatland, and continuously forested areas within the meaning of Article 29(4)(a), (b) and (c) of Directive (EU) 2018/200 .

(4) Transition to a circular economy	At least 70 % (by weight) of the non-hazardous construction, demolition or other waste materials (excluding naturally occurring material defined in category 17 05 04 in the European List of Waste established by Decision 2000/532/EC) generated on the construction site is prepared for reuse, recycling and other material recovery, including backfilling operations using waste to substitute other materials, in accordance with the waste hierarchy, unless a clear justification is given in the approved Remediation Plan based on technical or environmental reasons, other than cost considerations.
(5) Pollution prevention and control	DNSH as set out in Appending C of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852) In case the use of a remediation method making use of restricted or controlled substances listed above is selected as the best alternative, a full justification based on a direct comparison with other alternatives and reasons other than cost considerations is duly provided in the remediation plan (criterion 1.3).
(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appending D of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852) Moreover, in areas designated by the national competent authority for conservation or in habitats that are protected, the activity is in accordance with the conservation objectives for those areas. There is no conversion of habitats specifically sensitive to biodiversity loss or with high conservation value, or of areas set aside for the restoration of such habitats in accordance with national law. The plan referred to in point 2 (restoration plan) of the section 'screening criteria for substantial contribution' includes provisions for maintaining and possibly enhancing biodiversity in accordance with national and

	local provisions, including the following: (a) ensuring the good conservation status of habitat and species, (b) maintenance of typical habitat species. The introduction of invasive alien species is prevented and/or their spread is managed in accordance with Regulation (EU) No 1143/2014.

Rationale

Substantial contribution:

Remediation activities that substantially contribute to the environmental objective 'sustainable use and protection of water and marine resources' are enabling activities. Remediation activities have to be accompanied by a restoration activity in order to make a substantial contribution to the objective 'sustainable use and protection of water and marine resources'. The three pillars are:

- improving the status of water bodies through removal of pollutants or other anthropogenic pressures
- followed by a restoration activity that enhances the natural regeneration capacity of the water body in order to achieve an improvement in status as defined by Directive 2000/60/EC;
- complemented by a guarantee of permanence, e.g. by designating the future use of the water body and its surroundings or catchment area to ensure that further economic activities do not cause deterioration to an at least good ecological, chemical, quantitative and/or environmental status as defined in Directive 2000/60/EC and Directive 2008/56/EC respectively.

The SC criteria are based on 3 approaches:

- Performance based on environmental target: This concerns the need to ensure contaminants levels and water use/abstraction levels following remediation are reduced to a level compatible with national standards established to implement the provisions of Directive 2000/60/EC or Directive 2008/56/EC in order to achieve or maintain at least a good ecological, chemical, quantitative and/or environmental status.

- Practice based: This concerns the need to undertake the remediation activity in line with best industry practice.
- Process based: This concerns the need to carry out restoration or conservation activities after the remediation activity, and to establish a permanent restoration or conservation plan, which has to be approved by a competent authority. Moreover, regular audits have to be carried out by independent auditors.

In relation to the requirements in Art. 19 of the Taxonomy Regulation (EU) 2020/852:

- **Policy coherence and environmental integrity:** The proposed criteria are aligned with EU standards for water, including the policy goals and specific targets of the Water Framework Directive (2000/60/EC) and the Marine Strategy Framework Directive (2008/56/EC). Relevant metrics that can be used to quantify relevant performance targets related to risk for human health are set out in EU legislation only for water while they are not available for soil or sediment[642]. These performance targets for soil and sediment are present in national law in some countries of the EU and outside of the EU. In case these references are missing, the targets have to be defined on a case-by-case basis through a science based risk assessment (see Environmental ambition). This approach is in line with the EU Zero Pollution Action Plan;
- **Environmental ambition and integrity**: The level of environmental performance of the activity can be assessed robustly through the scientific characterisation of the contaminated area (baseline) and monitoring of pollution levels following the remediation and restoration or conservation activity. Specific practice based criteria are included to ensure these elements of best industry practice are part of the activity. Life cycle considerations are also captured with specific practice based criteria requiring the safe disposal of hazardous material resulting from the remediation activity
- **Level playing field**: The level of performance required in the criteria are completely technology neutral. The practice criteria also refer to best industry practice applicable irrespective of the remediation technique used. The criteria clearly leave the choice of remediation option completely open by referring to the requirements under Annex II of EU

[642] According Directive 2008/105/EC as amended by Directive 2013/39/EU MS should monitor concentrations of pollutants with significant accumulation potential in sediment (or biota).

Directive 2004/35/CE[643], which prioritise safety considerations as opposed to cost or technology ones. The criteria ensure that the management of the area or water body is based on a solid governance structure that ensures long-term sustainability of the activity.

- **Usability of the criteria:** The activity performance is measured directly on site on a case-by-case basis using sampling and analytic techniques widely available on the market. The best industry practices referred to in the criteria are very well established in the sector. Moreover, the establishment of a remediation plan and a restoration plan are common practice.

Important Notes:

- Remediation undertaken or commissioned by the same entity that is responsible for the pollution is excluded. In other words if the remediation activity is undertaken as an obligation resulting from the application of the Environmental Liability Directive, it cannot be a SC. This is due to the fact that 1) compliance with the regulatory framework would, in this case, be only compatible with a DNSH logic; and 2) it is not acceptable following the application of the polluter-pays principle underpinning the EU environmental acquis. As a result, only remediation activities undertaken by private or public entities outside the scope or exempt from the Environmental Liability Directive can make a SC to this objective.
- The reference in NACE category 39 to the decontamination of nuclear sites has not been included in the activity scope. There are specific challenges associated with the definition of potential substantial contribution towards environmental objectives from the decontamination of nuclear sites. For example, in relation to radioactive contaminated water in particular, former nuclear accidents clearly show that the decontamination is de facto not possible and is only done by discharging contaminated water into the sea and being diluted there. Thus, a substantial contribution to this environmental objective cannot be argued.
- The act of remediating an area (land, water body or other) **enables** the area to achieve the environmental objectives for water as set out in the WFD and in the MSFD and it can enable the re-use of the area for specific purposes (e.g. drinking water). By doing this, **remediation can indirectly substantially contribute to other environmental objectives**. The enabling nature of remediation is reflected in the criteria developed for the

[643] Directive 2004/35/CE on environmental liability with regard to the prevention and remedying of environmental damage, Annex II, point 1.3.1.

objectives for the other environmental objectives (see related Technical Screening Criteria).

DNSH: The criteria used reflect the standard wording used in the Appendixes to the Annex I to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852, with the following exceptions:

- CCM: The main potential harm to mitigation could derive from a land conversion leading to reduction in the carbon stock or from the use of techniques that entail GHG emissions as a by-product of the removal and/or treatment process. In the absence of clear regulatory reference in these areas, these elements are both captured by criteria based on best practice considerations;
- CE: A quantitative threshold of 70% by weight of the non-hazardous construction or demolition materials exists for buildings renovation and other infrastructure in the DA Annex I[644], but it could reveal too restrictive for some remediation activities or technologies. Therefore, the criterion is integrated with the possibility to stay below that threshold if properly justified in the Remediation Plan on the base of technical or environmental considerations.
- Biodiversity: In addition to the standard wording, a criterion aiming at the prevention of the introduction of invasive alien species is introduced.

PPC: The option of using restricted or controlled substances for the purpose of remediation is left open, provided proper justification, for reasons other than cost considerations, is provided in the remediation plan.

9.5 Remediation activities for the transition to a circular economy

Description of the activity

This activity includes:

[644] DA – Annex I – Section 7.2 - Renovation of existing buildings, DNSH Criteria for CE: *´At least 70 % (by weight) of the non-hazardous construction and demolition waste (excluding naturally occurring material referred to in category 17 05 04 in the European List of Waste established by Decision 2000/532/EC) generated on the construction site is prepared for re-use, recycling and other material recovery, including backfilling operations using waste to substitute other materials, in accordance with the waste hierarchy and the EU Construction and Demolition Waste Management Protocol ... ´.*

- decontamination of soils and groundwater at the place of pollution, either in situ or ex situ, using e.g. mechanical, chemical or biological methods
- decontamination of industrial plants or sites
- decontamination and cleaning up of surface water following accidental pollution, e.g. through collection of pollutants or through chemical or biological methods
- cleaning up oil spills and other pollutions on/in:
    - Surface water (WFD[645]):
        - Rivers
        - Lakes
        - Coastal waters
        - Transitional waters
    - Ground water (as defined in the WFD)
    - Marine water (as defined in the MSFD[646])
    - Sediments (for all surface water types)
    - Aquatic ecosystems
    - Buildings
    - Soil
    - Terrestrial ecosystems
- asbestos, lead paint, and other toxic material abatement
- other specialised pollution-control activities
- clean-up after disasters from natural hazards (flooding, earthquake etc.)
- removal of surface sealing and concreting
- remediation of old mining sites/legacies not associated with extraction revenues.

[645] Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy ('Water Framework Directive')

[646] Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy ('Marine Strategy Framework Directive')

In addition, it includes all enabling ancillary activities that are required to prepare, plan and follow-up the decontamination activity itself, for example:

- Surveying activities
- Sampling of soil, water, sediment, biota or other materials
- Laboratory analysis of samples to identify the nature and concentration of pollutants
- Demolition of contaminated buildings or other structures, and dismantling large-scale machinery and equipment (i.e. decommissioning)
- Earth moving/dredging: excavation, landfilling, levelling and any other activities necessary to operate the decontamination
- Control, monitoring and maintenance activities in the after-care phase

This activity excludes:

- purification of water for water supply purposes
- treatment of waste water
- treatment and disposal of non-hazardous waste, other than those generated during the remediation operation
- treatment and disposal of hazardous waste, other than those generated during the remediation operation
- morphological remediation
- remediation of legally non-conforming landfills and abandoned or illegal waste dumps
- emergency Services
- decontamination of nuclear plants or sites
- remediation activity undertaken to comply with the Environmental Liability Directive (2004/35/CE)[647]

[647] Directive 2004/35/CE on environmental liability with regard to the prevention and remedying of environmental damage, Annex II, point 2.

This activity is classified as several NACE codes (39, 33.22, 43.11, 43.12, 71.12, 71.20, 74.90, 81.30) according to the statistical classification of economic activities established by Regulation (EC) No.1893/2006.

Substantial contribution to transition to a circular economy

The activity fulfils simultaneously criteria 1, 2, 3, 4 and at least one between criteria 5a or 5b below:

1. The relevant contaminants are removed, controlled, contained and/or diminished using mechanical, chemical, biological or other methods so that the contaminated area (land, water body or other), taking into account its use at the time of the damage or approved future use of the area, no longer poses any significant risk of adversely affecting human health, as defined by:

   a. national regulatory standards OR, where these standards are not available,

   b. a risk-assessment taking into account the characteristic of the area (land, water body or other), the type and concentration of the harmful substances, preparations, organisms or micro- organisms, their risk and the possibility of their dispersion[648],[649].

2. The remediation activity is conducted in line with best industry practice and including all of the following elements:

   a. The original polluting source is removed permanently before any assessment or remediation activity is undertaken (except long range transboundary air pollution);

[648] Directive 2004/35/CE on environmental liability with regard to the prevention and remedying of environmental damage, Annex II, point 2.

[649] For outside EU operations where the Directive 2004/35/CE on environmental liability with regard to the prevention and remedying of environmental damage does not apply, it is to be followed at least the UNEP Guidance on the management of contaminated sites (UNEP/MC/COP.3/8/Rev.1) - Guidance_Contaminated_Sites_EN.pdf (mercuryconvention.org)

b. The exact location, type and extension of the contaminated area is well defined based on site-specific physical, chemical and/or microbiological data collection and analysis.

c. The remedial options are analysed in line with Annex II of EU Directive 2004/35/CE[650] or "EN ISO 18504:2017 Soil quality – sustainable remediation" and a remediation plan is developed accordingly;

d. Any hazardous or non hazardous waste extracted or otherwise produced by the remediation activity are subject to appropriate collection, transports, treatment, recovery and/or disposal by an authorized operator, in accordance with legal requirements

e. Remediation methods do not include reducing pollutant concentrations through dilution or watering down, unless a full justification, for environmental reason other than cost considerations, is provided in the remediation plan

f. Where appropriate, remediation plan must assess the risk of spreading invasive species, based both on likely occurrence and on actual site survey, and adopt appropriate mitigation measures[651]

g. Control, monitoring or maintenance activities in the after care phase of at least 10 years

3. The specific remediation and pollution monitoring plan is approved by the competent authority following consultation with local stakeholders; including the detailed strategy and actions to maximise reuse, prepare for reuse and recycling of all materials made available and handled during the remediation operation

4. Remediation activity is not undertaken as an obligation to comply with the Environmental Liability Directive (2004/35/CE).

5a. The remediation plan and/or the associated land-use plan states that the future reuse/redevelopment of the area/waterbody is dedicated to economic activities making a

[650] Directive 2004/35/CE on environmental liability with regard to the prevention and remedying of environmental damage, Annex II, point 1.3.1.

[651] Examples of mitigation measures include washing of machinery, sterilisation of transported soil, etc..

sustainable contribution to CE in line with criteria established under the Sustainable Finances Taxonomy

OR

5b. At least 90% by weight of all naturally occurring materials[652] made available and handled during the remediation operation are reused in situ or prepared for reuse ex-situ, AND all construction and demolition waste, organic and packaging waste generated during the remediation operation are prepared for reused or recycling in situ or ex situ (excluding backfilling) with the implementation of a sorting system to collect separately inert, packaging, organic and hazardous materials handled during the remediation operation.

Do no significant harm ('DNSH')

(1) Climate change mitigation	The activity does not involve the degradation of land, marine and inland freshwater with high carbon stock[653]. Measures to reduce GHG emissions based on a carbon footprint of the full removal and/or treatment process are included in the Remediation Plan.
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852
(3) Sustainable use and protection of water and marine resources	DNSH as set out in Appending B of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852 Environmental degradation risks related to preserving marine environment, in particular risk to the Good Environmental Status as

[652] Defined in category 17 05 04 in the European List of Waste established by Decision 2000/532/EC

[653] Land with high-carbon stock means wetlands, including peatland, and continuously forested areas within the meaning of Article 29(4)(a), (b) and (c) of Directive (EU) 2018/200 .

	defined in the Marine Strategy Framework Directive, are identified and addressed.
(5) Pollution prevention and control	DNSH as set out in Appending C of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852 In case the use of a remediation method making use of restricted or controlled substances listed above is selected as the best alternative, a full justification based on a direct comparison with other alternatives and reasons other than cost considerations is duly provided in the remediation plan (criterion 1.3).
(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appending D of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852 In areas designated by the national competent authority for conservation or in habitats that are protected, the activity is in accordance with the conservation objectives for those areas. There is no conversion of habitats specifically sensitive to biodiversity loss or with high conservation value, or of areas set aside for the restoration of such habitats in accordance with national law. The introduction of invasive alien species is prevented and/or their spread is managed in accordance with Regulation (EU) No 1143/2014.

Rationale

Substantial contribution:

The criteria combine the basic SC criteria applicable for Pollution Prevention and Control with criteria specific to the CE objective. The specific CE criteria ensure a significant contribution to CE objective by requiring that the remediation takes place according to circular practices - by maximising reuse and recycle of all materials made available and handled on remediated site,

or by ensuring that the CE objective is sustainably maintained over time by requiring that activities taking place on the remediated land make in turn a significant contribution to the CE objective.

The SC criteria are based on 3 approaches:

- Performance based on environmental target: This concerns the need to ensure contaminants levels following remediation are below a certain accepted thresholds considered safe from a human health and environmental point of view (PPC objective). Furthermore, there is a specific CE criteria to ensure that the remediated materials handled on site meet a by default 90% reuse, prepare for reuse and recycling rate, with the part of C&DW, organic and packaging waste being prepared for reuse or recycled, excluding backfilling.

- Practice based: This concerns the need to undertake the remediation activity in line with best industry practice (PPC objective) and with documented strategy and actions to maximise reuse, preparation for reuse and recycling documented in the approved remediation plan in view of specific circumstances

- Process based: This concerns the need to follow a certain number of steps, including a consultation to define a remediation plan (PPC objective), as well as the specific CE criteria of a prior evidence that activities contributing to CE objectives according to the Taxonomy will be established on remediated land.

In relation to the requirements in Art. 19 of the Taxonomy Regulation (EU) 2020/852:

- **Policy coherence and environmental integrity:** The proposed criteria are aligned with EU circular economy objective of maximising material recirculation and waste treatment hierarchy, putting reuse and recycling of materials as preferred options versus landfilling or incineration which are to be minimised. There are no specific EU legal targets for reuse, preparation for reuse or recycling of material handled during remediation activities. The closest material stream covered by a EU legal target to which remediated materials out of a remediation operation may look like is construction and demolition waste (CDW) potentially also including materials from excavated areas. In view of the 70% minimum requirements for recycling and backfilling of construction and demolition waste established in the Waste Framework Directive of 2008, reinstated in the revised version of 2018, and the DNSH formulation for CE objective that only preparation for reuse and recycling should be considered, excluding backfilling to reach this 70% rate, the 90% by default reuse &

recycling of materials handled during remediation operations appears ambitious but achievable to go beyond the minimum requirements set for construction and demolition waste (also noting that some MSs achieve today an 80% or higher recycling&backfilling rate for C&D waste according to EEA). In addition, the EU has set an objective of maximum 10% landfilling for municipal solid waste (MSW), as part of the revised Landfill Directive in 2018. Of course, material made available on remediated sites are not similar to MSW, but they are also more homogeneous and mostly inert, meaning unproper for incineration.

As regards PPC, relevant metrics that can be used to quantify relevant performance targets related to risk for human health and the environment are set out in EU legislation only for water while they are not available for soil or sediment. These performance targets for soil and sediment are present in national law in some countries of the EU and outside of the EU. In case these references are missing, the targets have to be defined on a case-by-case basis through a science based risk assessment (see Environmental ambition). This approach is in line with the EU Zero Pollution Action Plan;

- **Environmental ambition and integrity**: Beyond the above justification to set a 90% reuse, preparation for reuse and recycling rate of handled materials, this value is also documented as an achievable rate for iconic remediation activities, as presented in the EIONET-EC document of 2017 on *European achievements in soil remediation and brownfield redevelopment.* Operations like the remediation of brownfield sites in London area before creating the Olympic Park with a reuse and recycling rate of 98.5%, or in the French town of Pont à Mousson with 100% reused of excavated soils in situ, show that the 90% is achievable. It is worth noting that in most operations documented in 2017 by the EIONET-EC network, the maximizing of reuse and recycling rate was not only considered an environmental achievement, but was also reported as an economical option compared to excavating and disposing ex situ (quote from a testimony on a brownfield remediation in Finland: *The savings made by recycling the large portion of contaminated masses were the main reason for achieving the economic success of the restoration project).*The requirement that activities contributing to CE are established on remediated land ensures an environmental integrity over time.

As we propose that only one of the two criteria between 5 and 6 is at least fulfilled to make a significant contribution to CE, the ambition, while being high is not over challenging. In case there is a certainty that activities taking place on remediated site will be contributing to CE, the requirements to maximise reuse, preparation for reuse and recycling may be less stringent. Reversely, should there be no guarantee that a significant CE contribution

is maintained over time, then the remediation operation itself should show a high level of circularity by achieving the 90% target.

As regards PPC, specific practice based criteria are included to ensure that elements of best industry practice are part of the activity.

- **Level playing field**: The level of performance required in the criteria are completely technology neutral. The fact that the reuse, preparation for reuse and recycling expected rate with related detailed strategy and actions is a part of the approved remediation plan also reinforces the level playing field as possible 'bidders' to conduct the remediation operations will all have to document the strategy to optimise the reuse & recycling rate. The level playing field is also ensured by the fact that any business interested in reusing the remediated site needs to demonstrate why the future activities will make a sustainable contribution to CE objective, while not imposing any specific nature of the activities.

  As regard PPC, the practice criteria also refer to best industry practice applicable irrespective of the remediation technique used. The criteria clearly leave the choice of remediation option completely open by referring to the requirements under Annex II of EU Directive 2004/35/CE[654], which prioritise safety considerations as opposed to cost or technology ones.

- **Usability of the criteria:** The criteria can be used in any public or private bids, notably as they integrate the approval of a remediation plan detailing the strategy and actions to either achieve the reused, preparation for reuse and recycling 90% default target, or the type of activities to be established in the future. The bodies commissioning the remediation operations can make use of the criteria directly to evaluate the bidders. The data to establish the activity performance in terms of reuse & recycling rate is measured directly on site on a case-by-case basis using ex ante sampling and analytic evaluation techniques widely available on the market at an affordable price through several service providers (no monopoly exists influencing market prices). The ex post evaluation of the reuse and recycling achievements can also be documented through the report on total amount of

[654] Directive 2004/35/CE on environmental liability with regard to the prevention and remedying of environmental damage, Annex II, point 1.3.1.

remediated materials versus materials sent to landfill and incineration (possibly conditioning some final payments).

As regards PPC, the best industry practices referred to in the criteria are well established in the sector.

Important Notes:

- Remediation undertaken or commissioned by the same entity that is responsible for the pollution is excluded. In other words if the remediation activity is undertaken as an obligation resulting from the application of the Environmental Liability Directive, it cannot be a SC. This is due to the fact that 1) compliance with the regulatory framework would, in this case, be only compatible with a DNSH logic; and 2) it is not acceptable following the application of the polluter-pays principle underpinning the EU environmental acquis. As a result, only remediation activities undertaken by private or public entities outside the scope or exempt from the Environmental Liability Directive can make a SC to this objective.

- The mere possibility to reuse the remediated land cannot be sufficient to be considered contributing to the CE objective, even if the remedial targets are protective of human health and natural resources (water, soil) as stated in the EC document 'categorisation system for the circular economy' for activity 2d, because 1) this would not make any difference with the PPC objective; 2) this would not require any maximization of reuse and recycling of remediated materials; 3) this would per se not ensure any sustainable contribution to CE over time. It is worth noting that the EC seems to have hinted in that direction that mere reuse of land may not be enough to contribute to CE objective, as they state as a generic guidance in the aforementioned document that *The refurbishment/repurposing of existing buildings and infrastructure on the site shall qualify as a circular activity where it meets the criteria for circular category 2.b. Replacements with new buildings and infrastructure shall qualify where it meets the criteria for circular category 1.a .*

- The suggestion not to restrict the reuse, preparation to reuse and recycling target to non-hazardous materials handled during the remediation is to avoid a loophole that could consist in qualifying as hazardous the whole of contaminated soil, or improperly sorted mixed materials containing hazardous to ease the compliance. In contrary, including also hazardous materials will promote a finer, in situ decontamination of soils, a proper

sorting of the hazardous fraction, or even the research of recycling of some hazardous materials if relevant.

- The suggestion to exclude backfilling only for C&DW, organic and packaging waste, and not to all materials handled during the remediation comes from the fact that most soil materials reused in situ or ex situ may be a backfilling operation and not qualify as recycling per se. It is also to be noted that we cannot exclude the idea of reusing soil material, rather than considering a preparation for reuse for soil fractions, as soil excavated and reused on site may never enter the waste status. For other materials, such as C&D materials, organic materials, packaging materials, a transit through a waste regime is expected, that's why it can be said only preparation for reuse or recycling for those streams.

- The reference in NACE category 39 to the decontamination of nuclear sites has not been included in the activity scope. There are specific challenges associated with the definition of potential substantial contribution towards environmental objectives from the decontamination of nuclear sites. For example, in relation to radioactive contaminated water in particular, former nuclear accidents clearly show that the decontamination is de facto not possible and is only done by discharging contaminated water into the sea and being diluted there. Thus, a substantial contribution to this environmental objective cannot be argued.

DNSH: The criteria used reflect the standard wording used in the Appendixes to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852, with the following exceptions:

- Climate Change Mitigation: The main potential harm to mitigation could derive from a land conversion leading to reduction in the carbon stock or from the use of techniques that entail GHG emissions as a by-product of the removal and/or treatment process. In the absence of clear regulatory reference in these areas, these elements are both captured by criteria based on best practice considerations;

- Biodiversity: In addition to the standard wording, a criterion aiming at the prevention of the introduction of invasive alien species is introduced

9.6 Remediation activities for pollution prevention and control

Description of the activity

This activity includes:

- decontamination of soils and groundwater at the place of pollution, either in situ or ex situ, using e.g. mechanical, chemical or biological methods
- decontamination of industrial plants or sites
- decontamination and cleaning up of surface water following accidental pollution, e.g. through collection of pollutants or through chemical or biological methods
- cleaning up oil spills and other pollutions on/in:
    - Surface water (WFD):
        - Rivers
        - Lakes
        - Coastal waters
        - Transitional waters
    - Ground water (as defined in the Water Framework Directive - WFD[655])
    - Marine water (as defined in the Marine Strategy Framework Directive - MSFD656)
    - Sediments (for all surface water types)
    - Aquatic ecosystems
    - Buildings
    - Soil
    - Terrestrial ecosystems
- asbestos, lead paint, and other toxic material abatement
- other specialised pollution-control activities

[655] Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy ('Water Framework Directive')

[656] Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy ('Marine Strategy Framework Directive')

- clean-up after disasters from natural hazards (flooding, earthquake etc.)
- removal of surface sealing and concreting
- remediation of old mining sites/legacies not associated with extraction revenues.

In addition, it includes all enabling ancillary activities that are required to prepare, plan and follow-up the decontamination activity itself, for example:

- Surveying activities
- Sampling of soil, water, sediment, biota or other materials
- Laboratory analysis of samples to identify the nature and concentration of pollutants
- Demolition of contaminated buildings or other structures, and dismantling large-scale machinery and equipment (i.e. decommissioning)
- Earth moving/dredging: excavation, landfilling, levelling and any other activities necessary to operate the decontamination

This activity excludes:

- purification of water for water supply purposes
- treatment and disposal of hazardous or non-hazardous waste, other than those generated during the remediation activities
- morphological remediation
- remediation of legally non-conforming landfills and abandoned or illegal waste dumps
- emergency Services
- decontamination of nuclear plants and sites
- remediation activity undertaken to comply with the Environmental Liability Directive (2004/35/CE)

This activity is classified as several NACE codes (39, 33.22, 43.11, 43.12, 71.12, 71.20, 74.90, 81.30) according to the statistical classification of economic activities established by Regulation (EC) No.1893/2006.

Substantial contribution to pollution prevention and control

The activity fulfils cumulatively all criteria below:

1. The relevant contaminants are removed, controlled, contained and/or diminished using mechanical, chemical, biological or other methods so that the contaminated area (land, water body or other), taking into account its use at the time of the damage or approved future use of the area, no longer poses any significant risk of adversely affecting human health, as defined by:

    a. national regulatory standards OR, where these standards are not available,

    b. a risk-assessment taking into account the characteristic and the extent of the impacted area (land, water body or other), the type, properties (persistence, mobility and toxicity) and concentration of the substances, preparations, organisms or micro- organisms, possible migration pathways and the probability of dispersion[657],[658].

2. The remediation activity is conducted in line with best industry practice and including all of the following elements:

    a. The original polluting source is removed permanently before any assessment or remediation activity is undertaken (except long-range transboundary air pollution);

    b. The exact location, type and extension of the contaminated area is well defined based on site specific physical, chemical and/or microbiological data collection and analysis;

    c. The remedial options are analysed in line with Annex II of EU Directive 2004/35/CE[659] or "EN ISO 18504:2017 Soil quality – sustainable remediation"

[657] Directive 2004/35/CE on environmental liability with regard to the prevention and remedying of environmental damage, Annex II, point 2.

[658] For remediation activities outside the EU: Unless more stringent standards are mandatory under national legislation, the UNEP Guidance on the management of contaminated sites (UNEP/MC/COP.3/8/Rev.1) - Guidance_Contaminated_Sites_EN.pdf (mercuryconvention.org) shall be applied.

[659] Directive 2004/35/CE on environmental liability with regard to the prevention and remedying of environmental damage, Annex II, point 1.3.1.

and the most suitable remedial measures are defined in a dedicated remediation plan, including monitoring requirements.

d. Any hazardous or non-hazardous waste extracted or otherwise produced by the remediation activity is subject to appropriate collection, transports, treatment, recovery and/or disposal by an authorized operator, in accordance with legal requirements;

e. Remediation methods based exclusively on reducing pollutant concentrations through dilution or watering down are not considered acceptable.

f. Where appropriate, remediation plan must assess the risk of spreading invasive species, based both on likely occurrence and on actual site survey, and adopt appropriate mitigation measures

g. Control, monitoring or maintenance activities in the after-care phase of at least 10 years

3. The specific remediation and pollution monitoring plan is approved by the competent authority following consultation with local stakeholders;

4. Remediation activity is not undertaken as an obligation to comply with the Environmental Liability Directive (2004/35/CE).

Do no significant harm ('DNSH')	
(1) Climate change mitigation	The activity does not involve the degradation of land with high carbon stock[660]. Measures to reduce scope 1 and scope 2 GHG emissions of the full removal and/or treatment process are included in the Remediation Plan.

[660] Land with high-carbon stock means wetlands, including peatland, and continuously forested areas within the meaning of Article 29(4)(a), (b) and (c) of Directive (EU) 2018/200 .

(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852
(3) Sustainable use and protection of water and marine resources	DNSH as set out in Appending B of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852 Environmental degradation risks related to preserving marine environment, in particular risk to the Good Environmental Status as defined in the Marine Strategy Framework Directive, are identified and addressed.
(4) Transition to a circular economy	At least 70 % (by weight) of the non-hazardous construction, demolition or other waste materials (excluding naturally occurring material defined in category 17 05 04 in the European List of Waste established by Decision 2000/532/EC) generated on the construction site is prepared for reuse, recycling and other material recovery, including backfilling operations using waste to substitute other materials, in accordance with the waste hierarchy, unless a clear justification is given in the approved Remediation Plan based on technical or environmental reasons, other than cost considerations.
(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appending D of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852. In areas designated by the national competent authority for conservation or in habitats that are protected, the activity is in accordance with the conservation objectives for those areas. There is no conversion of habitats specifically sensitive to biodiversity loss or with high conservation value, or of areas set aside for the restoration of such habitats in accordance with national law.

	The introduction of invasive alien species is prevented and/or their spread is managed in accordance with Regulation (EU) No 1143/2014.

Rationale

Substantial Contribution: Remediation activities make an **Own Performance** substantial contribution to the Pollution Prevention and Control objective because of the nature of the activity itself. Therefore, the SC criteria are based on two main elements:

- Performance based on environmental target: This concerns the need to ensure contaminants levels following remediation are below a certain accepted thresholds considered safe from a human health point of view. Given that not all countries have defined thresholds in their legal framework, the criteria leave the flexibility to define the threshold on the base of a tailored risk assessment in the absence of regulatory standards.

- Practice based: This concerns the need to undertake the remediation activity in line with best industry practice.

In relation to the requirements in art. 19 of the Taxonomy Regulation (EU) 2020/852:

Policy coherence: Relevant metrics that can be used to quantify relevant performance targets related to risk for human health are set out in EU legislation only for water while they are not available for soil or sediment. These performance targets for soil and sediment are present in national law in some countries of the EU and outside of the EU. In case these references are missing, the targets have to be defined on a case-by-case basis through a science based risk assessment (see Environmental ambition). This approach is in line with the EU Zero Pollution Action Plan;

Environmental ambition and integrity: The level of environmental performance of the activity can be assessed robustly through the scientific characterisation of the contaminated area (baseline) and monitoring of pollution levels following the remediation activity. Specific practice based criteria are included to ensure these elements of best industry practice are part of the activity. Life cycle considerations are also captured with specific practice based

criteria requiring the safe disposal of hazardous material resulting from the remediation activity;

Level playing field: The environmental target and the level of performance required in the criteria are completely technology neutral. The practice criteria also refer to best industry practice applicable irrespective of the remediation technique used. The criteria clearly leave the choice of remediation option completely open by referring to the requirements under Annex II of EU Directive 2004/35/CE[661] which prioritise safety considerations as opposed to cost or technology ones;

Usability of the criteria: Data on the activity performance is measured directly on site on a case-by-case basis using sampling and analytic techniques widely available on the market at an affordable price through several service providers (no monopoly exists influencing market prices). The best industry practices referred to in the criteria are very well established in the sector.

Important Notes:

- Remediation undertaken or commissioned by the same entity that is responsible for the pollution is excluded. In other words if the remediation activity is undertaken as an obligation resulting from the application of the Environmental Liability Directive, it cannot be a SC. This is due to the fact that 1) compliance with the regulatory framework would, in this case, be only compatible with a DNSH logic; and 2) it is not acceptable following the application of the polluter-pays principle underpinning the EU environmental acquis. As a result, only remediation activities undertaken by private or public entities outside the scope or exempt from the Environmental Liability Directive can make a SC to this objective.

- The reference in NACE category 39 to the decontamination of nuclear sites has not been included in the activity scope. There are specific challenges associated with the definition of potential substantial contribution towards environmental objectives from the decontamination of nuclear sites. For example, in relation to radioactive contaminated water in particular, former nuclear accidents clearly show that the decontamination is de

[661] Directive 2004/35/CE on environmental liability with regard to the prevention and remedying of environmental damage, Annex II, point 1.3.1.

facto not possible and is only done by discharging contaminated water into the sea and being diluted there. Thus, a substantial contribution to this environmental objective cannot be argued.

- The act of remediating an area (land, water body or other) **enables** the re-use of the area for the same or other economic activities. By doing this **remediation can indirectly substantially contribute to other environmental objectives depending on the nature/purpose of the economic activity that it enables**. The enabling nature of remediation is reflected in the criteria developed for the other environmental objectives (see related Technical Screening Criteria.

DNSH: The criteria used reflect the standard wording used in the Appendixes to the Annex I to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852, with the exception of Climate Change Mitigation and Circular Economy.

- Climate Change Mitigation: The main potential harm to mitigation could derive from a land conversion leading to reduction in the carbon stock or from the use of techniques that entail GHG emissions as a by-product of the removal and/or treatment process. In the absence of clear regulatory reference in these areas, these elements are both captured by criteria based on best practice considerations;

- CE: A quantitative threshold of 70% by weight of the non-hazardous construction or demolition materials exists for buildings renovation and other infrastructure in the Climate Delegated Act, Annex I[662], but it could reveal too restrictive for some remediation activities or technologies. Therefore, the criterion is integrated with the possibility to stay below that threshold if properly justified in the Remediation Plan on the base of technical or environmental considerations.

- Biodiversity: In addition to the standard wording, a criterion aiming at the prevention of the introduction of invasive alien species is introduced. Wording for areas under conservation

[662] Climate Delegated Act – Annex I – Section 7.2 - Renovation of existing buildings, DNSH Criteria for CE: *´At least 70 % (by weight) of the non-hazardous construction and demolition waste (excluding naturally occurring material referred to in category 17 05 04 in the European List of Waste established by Decision 2000/532/EC) generated on the construction site is prepared for re-use, recycling and other material recovery, including backfilling operations using waste to substitute other materials, in accordance with the waste hierarchy and the EU Construction and Demolition Waste Management Protocol ... ´.*

is added (extracted from Annex I to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852 – Restoration of Wetlands).

9.7 Remediation activities enabling restoration of ecosystems

Description of the activity

This activity includes:

- decontamination of soils and groundwater at the place of pollution, either in situ or ex situ, using e.g. mechanical, chemical or biological methods
- decontamination of industrial plants or sites
- decontamination and cleaning up of surface water following accidental pollution, e.g. through collection of pollutants or through chemical or biological methods
- cleaning up oil spills and other pollutions on/in:
    - Surface water (as defined in the WFD):
        - Rivers
        - Lakes
        - Coastal waters
        - Transitional waters
    - Ground water (as defined in the Water Framework Directive – WFD)
    - Marine water (as defined in the Marine Strategy Framework Directive – MSFD)
    - Sediments (for all surface water types)
    - Aquatic ecosystems
    - Buildings
    - Soil
    - Terrestrial ecosystems
- asbestos, lead paint, and other toxic material abatement
- other specialised pollution-control activities

- clean-up after disasters from natural hazards (flooding, earthquake etc.)
- removal of surface sealing and concreting
- remediation of old mining sites/legacies not associated with extraction revenues.

In addition, it includes all ancillary enabling activities that are directly necessary to prepare, plan and follow-up the decontamination activity itself, for example:

- Surveying activities
- Sampling of soil, water, sediment, biota or other materials
- Laboratory analysis of samples to identify the nature and concentration of pollutants
- Demolition of contaminated buildings or other structures, and dismantling large-scale machinery and equipment (i.e. decommissioning)
- Earth moving/dredging: excavation, landfilling, levelling and any other activities necessary to operate the decontamination
- Control, monitoring and maintenance activities in the after-care phase

This activity excludes:

- purification of water for water supply purposes
- treatment of waste water
- treatment and disposal of non-hazardous waste and hazardous waste other than those generated during the remediation activity itself
- morphological remediation
- remediation of legally non-conforming landfills and abandoned or illegal waste dumps
- emergency services
- decontamination of nuclear plants or sites
- remediation activity undertaken to comply with the Environmental Liability Directive (2004/35/CE)

This activity is classified as several NACE codes (39, 33.22, 43.11, 43.12, 71.12, 71.20, 74.90, 81.30) according to the statistical classification of economic activities established by Regulation (EC) No.1893/2006.

Substantial contribution to protection and restoration of biodiversity and ecosystems

The activity fulfils cumulatively all criteria below:

1 Remediation measures: All criteria below are fulfilled:

1.1. The relevant contaminants are removed, controlled, contained and/or diminished using mechanical, chemical, biological or other methods so that the contaminated area (land, water body or other), taking into account its approved future use of the area, no longer poses any significant risk of adversely affecting human health and the environment[663], as defined by:

a. national standards related to protected species and natural habitats[664],

OR, where these standards are not available,

b. a risk-assessment taking into account the characteristic and the extent of the impacted area (land, water body or other), the type, properties (persistence, mobility and toxicity) and concentration of the substances, preparations, organisms or micro- organisms, possible migration pathways and the probability of dispersion [665],[666].

1.2. The remediation activity is conducted in line with best industry practice and including all of the following elements:

[663] Directive 2004/35/CE on environmental liability with regard to the prevention and remedying of environmental damage, Annex II, point 2.

[664] EU Environmental Quality Standards set under the Environmental Quality Standards Directive 2008/105/EC, the Groundwater Directive 2006/118/EC, the Marine Strategy Framework Directive 2008/56/EC, the Habitats Directive 92/43/EEC and the Birds Directive 2009/147/EC. The targets of the EU Biodiversity Strategy 2030 and Restoration Law (under preparation) are noted.

[665] Directive 2004/35/CE on environmental liability with regard to the prevention and remedying of environmental damage, Annex II, point 2.

[666] For remediation activities outside the EU: Unless more stringent standards are mandatory under national legislation, the UNEP Guidance on the management of contaminated sites (UNEP/MC/COP.3/8/Rev.1) - Guidance_Contaminated_Sites_EN.pdf (mercuryconvention.org) are applied.

a. The original polluting sources are removed permanently before any remediation activity is undertaken (except long-range transboundary air pollution);

b. The exact location, type and extension of the contaminated area is well defined based on site specific physical, chemical and/or microbiological data collection and analysis.

c. The remedial options are analysed in line with Annex II of EU Directive 2004/35/CE[667] or "EN ISO 18504:2017 Soil quality – sustainable remediation" and the most suitable remedial measures are defined in a dedicated remediation plan[668], including monitoring requirements.

d. Any hazardous and non-hazardous waste extracted or otherwise produced by the remediation activity is subject to appropriate collection, transports, treatment, recovery and/or disposal by an authorized operator, in accordance with legal requirements.

e. Remediation methods do not include reducing pollutant concentrations through dilution or watering down, unless a full justification, for reason other than cost considerations, is provided in the remediation plan.

f. Where appropriate, remediation plan must assess the risk of spreading invasive species, based both on likely occurrence and on actual site survey, and adopt appropriate mitigation measures

g. Control, monitoring or maintenance activities in the after-care phase of at least 10 years

1.3. The remediation and pollution monitoring plan is approved by the competent authority following consultation with local stakeholders;

1.4. The remediation activity is not undertaken as an obligation to comply with the Environmental Liability Directive (2004/35/CE).

[667] Directive 2004/35/CE on environmental liability with regard to the prevention and remedying of environmental damage, Annex II, point 1.3.1.

[668] Art. 7 of Environmental Liability Directive 2004/35/CE

2 Restoration and conservation measures: All criteria below are fulfilled:

2.1. The remediated land area or waterbody is destined to conservation and/or restoration measures as defined in a dedicated Restoration or Conservation Management Plan or an equivalent instrument covering the whole period considered necessary to achieve the restoration or conservation goals and accepted by the competent authority and in line with the technical screening criteria for substantial contribution to 'protection and restoration of biodiversity and ecosystems' defined under the economic activity ´Conservation of Habitats and Ecosystems´ or the economic activity ´Restoration of Ecosystems´.

2.2. Any economic use of the remediated area under conservation/restoration is compatible with the conservation/restoration objectives of the area as defined in the Restoration or Conservation Management Plan or an equivalent instrument and does not cause any deterioration to biodiversity.

3 Guarantee of permanence: All criteria below are fulfilled:

3.1. The remediated area or waterbody on which the activity takes place is protected from conversion and deterioration for a minimum of 5 years beyond the period considered necessary to achieve the goals set in the Restoration or Conservation Management Plan or an equivalent instrument by one of the following measures:

a. the area is classified as a protected area under any of the IUCN Categories[669] by national law and/or under an international convention to which the country is signatory.

b. OR the area is the subject to a long-term public or private contractual agreement ensuring that it will remain a restoration or conservation area.

[669] Protected Area Categories | IUCN

c. OR the area is destined to preservation in its natural state in a statutory land, freshwater or maritime use plan approved by the competent authorities[670].

3.2. The owner of the area where the remediation activity takes place, commits to the public authority - as part of the Restoration or Conservation Management Plan or an equivalent instrument - that future updates to the respective plan will continue to pursue the good condition of ecosystems as defined in the relevant national law[671].

4 Audit

Within two years after the completion of the remediation activity and every 2 years thereafter, the compliance with the Restoration or Conservation Management Plan or an equivalent instrument, is verified by either of the following:

4.1. the relevant national competent authorities;

4.2. OR an independent third-party certifier, at the request of national authorities or the operator of the activity.

In order to reduce costs, audits may be performed together with any biodiversity and ecosystem certification.

The independent third-party verifier must not have any conflict of interest with the owner or the funder and may not be involved in the development or operation of the activity.

Do no significant harm ('DNSH')

[670] Member States shall endeavour, where they consider it necessary, in their land-use planning and development policies and, in particular, with a view to improving the ecological coherence of the Natura 2000 network, to encourage the management of features of the landscape which are of major importance for wild fauna and flora (Art. 10 in Habitats Directive (92/43/EEC).

[671] Based on the Habitats Directive (92/43/EEC), Water Framework Directive (2000/60/EC), Floods Directive (2007/60/EC), Marine Strategy Framework Directive (2008/56/EC) and Restoration Law (under preparation)

(1) Climate change mitigation	The activity does not involve the degradation of land, marine and inland freshwaters with high carbon stock[672]. Measures to reduce scope 1 and scope 2 GHG emissions of the full removal and/or treatment process are included in the remediation plan.
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852
(3) Sustainable use and protection of water and marine resources	DNSH as set out in Appending B of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852. Environmental degradation risks related to preserving marine environment, in particular risk to the Good Environmental Status as defined in the Marine Strategy Framework Directive, are identified and addressed.
(4) Transition to a circular economy	At least 70 % (by weight) of the non-hazardous construction, demolition or other waste materials (excluding naturally occurring material defined in category 17 05 04 in the European List of Waste established by Decision 2000/532/EC) generated on the construction site is prepared for reuse, recycling and other material recovery, including backfilling operations using waste to substitute other materials, in accordance with the waste hierarchy, unless a clear justification is given in the approved Remediation Plan based on technical or environmental reasons, other than cost considerations.

[672] Land with high-carbon stock means wetlands, including peatland, and continuously forested areas within the meaning of Article 29(4)(a), (b) and (c) of Directive (EU) 2018/200.

(5) Pollution prevention and control	DNSH as set out in Appending C of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852. In case the use of a remediation method making use of restricted or controlled substances listed above is selected as the best alternative, a full justification based on a direct comparison with other alternatives and reasons other than cost considerations is duly provided in the remediation plan (criterion 1.3).

Rationale

Substantial Contribution:

Remediation activities have to be accompanied by a restoration or a conservation activity in order to make a substantial contribution to the objective 'protection and restoration of biodiversity and ecosystems'. The three pillars are:

- improving the status of area through removal of pollutants or other anthropogenic pressures (criteria 1.1. - 1.4.)
- followed by restoration or conservation measures and (criteria 2)
- complimented by a guarantee of permanence and audits (criteria 3 - 4)

The SC criteria are based on 3 approaches:

- Performance based on environmental target: This concerns the need to ensure contaminants levels following remediation are below certain accepted thresholds considered safe from a human health. Given that not all countries have defined thresholds in their legal framework, the criteria leave the flexibility to define the threshold on the base of a tailored risk assessment in the absence of regulatory standards. The specific environmental targets from a biodiversity point of view are defined in Restoration or Conservation Management Plan or an equivalent instrument.
- Practice based: This concerns the need to undertake the remediation activity in line with best industry practice.

- Process based: This concerns the need to carry out restoration or conservation activities after the remediation activity, and to establish a permanent restoration or conservation plan or an equivalent instrument, which has to be approved by a competent authority. Moreover, regular audits have to be carried out by independent auditors.

In relation to the requirements in Art. 19 of the Taxonomy Regulation (EU) 2020/852:

- **Policy coherence and environmental integrity**: The proposed criteria are aligned with EU or international standards for biodiversity, for example with the policy goals and specific targets of the EU Biodiversity Strategy 2030 or Convention on Biological Diversity or the leading organisation in the areas of conservation (e.g. IUCN). Relevant metrics that can be used to quantify relevant performance targets related to risk for human health are set out in EU legislation only for water while they are not available for soil or sediment. These performance targets for soil and sediment are present in national law in some countries of the EU and outside of the EU. In case these references are missing, the targets have to be defined on a case-by-case basis through a science-based risk assessment (see Environmental ambition). This approach is in line with the EU Zero Pollution Action Plan;

- **Environmental ambition and integrity**: The level of environmental performance of the activity can be assessed robustly through the scientific characterisation of the contaminated area (baseline) and monitoring of pollution levels following the remediation and restoration or conservation activity. Specific practice-based criteria are included to ensure these elements of best industry practice are part of the activity. Life cycle considerations are also captured with specific practice-based criteria requiring the safe disposal of hazardous material resulting from the remediation activity;

- **Level playing field**: The level of performance required in the criteria are completely technology neutral. The practice criteria also refer to best industry practice applicable irrespective of the remediation technique used. The criteria clearly leave the choice of remediation option completely open by referring to the requirements under Annex II of EU Directive 2004/35/CE[673], which prioritise safety considerations as opposed to cost or

[673] Directive 2004/35/CE on environmental liability with regard to the prevention and remedying of environmental damage, Annex II, point 1.3.1.

technology ones. The criteria ensure that the management of the area is based on a solid governance structure that ensures long-term sustainability of the activity;

- **Usability of the criteria**: Data on the activity performance is measured directly on site on a case-by-case basis using sampling and analytic techniques widely available on the market at an affordable price through several service providers (no monopoly exists influencing market prices). The best industry practices referred to in the criteria are very well established in the sector.

Important Notes:

- Remediation undertaken or commissioned by the same entity that is responsible for the pollution is excluded. In other words, if the remediation activity is undertaken as an obligation resulting from the application of the Environmental Liability Directive, it cannot be a SC. This is due to the fact that 1) compliance with the regulatory framework would, in this case, be only compatible with a DNSH logic; and 2) it is not acceptable following the application of the polluter-pays principle underpinning the EU environmental acquis. As a result, only remediation activities undertaken by private or public entities outside the scope or exempt from the Environmental Liability Directive can make a SC to this objective.

- The reference in NACE category 39 to the decontamination of nuclear sites has not been included in the activity scope. There are specific challenges associated with the definition of potential substantial contribution towards environmental objectives from the decontamination of nuclear sites. For example, in relation to radioactive contaminated water in particular, former nuclear accidents clearly show that the decontamination is de facto not possible and is only done by discharging contaminated water into the sea and being diluted there. Thus, a substantial contribution to this environmental objective cannot be argued.

- The act of remediating an area (land, water body or other) **enables** the re-use of the area for the same or other economic activities. By doing this **remediation can indirectly substantially contribute to other environmental objectives depending on the nature/purpose of the economic activity that it enables**. The enabling nature of remediation is reflected in the criteria developed for the other environmental objectives (see related Technical Screening Criteria).

DNSH: The criteria used reflect the standard wording used in the Appendixes to the Annex I to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852, with the exception of Climate Change Mitigation and Circular Economy.

- Climate Change Mitigation: The main potential harm to mitigation could derive from a land conversion leading to reduction in the carbon stock or from the use of techniques that entail GHG emissions as a by-product of the removal and/or treatment process. In the absence of clear regulatory reference in these areas, these elements are both captured by criteria based on best practice considerations;

- Circular Economy: A quantitative threshold of 70% by weight of the non-hazardous construction or demolition materials exists for buildings renovation and other infrastructure in the DA Annex I[674], but it could reveal too restrictive for some remediation activities or technologies. Therefore, the criterion is integrated with the possibility to stay below that threshold if properly justified in the Remediation Plan on the base of technical or environmental considerations.

Pollution prevention and control: The option of using restricted or controlled substances for the purpose of remediation is left open, provided proper justification, for reasons other than cost considerations, is provided in the remediation plan.

[674] DA – Annex I – Section 7.2 - Renovation of existing buildings, DNSH Criteria for CE: *´At least 70 % (by weight) of the non-hazardous construction and demolition waste (excluding naturally occurring material referred to in category 17 05 04 in the European List of Waste established by Decision 2000/532/EC) generated on the construction site is prepared for re-use, recycling and other material recovery, including backfilling operations using waste to substitute other materials, in accordance with the waste hierarchy and the EU Construction and Demolition Waste Management Protocol ... ´.*

10. Tourism

10.1 Hotels, holiday, camping grounds and similar accommodation

Description of the activity

The provision of short-term accommodation with or without associated services (e.g. cleaning, food and beverage services, parking, laundry services, swimming pools and exercise rooms, recreational facilities as well as conference and convention facilities etc.).

This includes accommodation provided by:

- hotels and motels of all kinds
- holiday homes
- visitor flats, bungalows, cottages and cabins
- youth hostels and mountain refuges
- campgrounds and trailer parks
- space and facilities for recreational vehicles
- recreational camps and fishing and hunting camps
- protective shelters or plain bivouac facilities for placing tents and/or sleeping bags

This category excludes:

- provision of homes and furnished or unfurnished flats or apartments for more permanent use, typically on a monthly or annual basis (NACE code L6820)

- cruise ships (NACE code H5010)

This activity is classified as part of 3 separate NACE codes (I5510, I5520 and I5530) according to the statistical classification of economic activities established by Regulation (EC) No.1893/2006.

The activity is an enabling activity as referred to in Article 15(1), point (e), of Regulation (EU) 2020/852 where it meets the technical screening criteria set out in this section.

Substantial contribution to protection and restoration of biodiversity and ecosystems

The activity fulfils simultaneously:

- All criteria under 1A or 1B
- All criteria under 2 and 3

Two options are, therefore, possible:

	Criteria			
	1A	**1B**	**2**	**3**
Option 1	√		√	√
Option 2		√	√	√

1A. Enabling activities

1A.1 - The activity is **enabling** conservation and/or restoration measures undertaken by separate management entity(ies) in clearly identified areas[675], within or in the proximity of the same tourist destination[676], in any of the following forms:

a) Offer and/or organise visits to dedicated conservation areas where entrance or permit/user fees are applied;

b) Operation of concessions and leases for services directly related to the conservation area (issued by the management entity);

c) Operation of tourist accommodation establishments within the conservation area but not subject to concession (in agreement with the management entity);

[675] Legally protected areas (PAs) or other effective area-based conservation measures (OECMs) with active management. The CBD defines OECM as *´a geographically defined area other than a protected area, which is governed and managed in ways that achieve positive and sustained long-term outcomes for the in-situ conservation of biodiversity, with associated ecosystem functions and services and where applicable, cultural, spiritual, socio-economic, and other relevant values´.* Protected areas and other effective area-based conservation measures (cbd.int)

[676] Tourism destination is defined in this context as a geographic area consisting of a set of resources and attractions that is promoted by the same Regional Tourism Organisation.

d) Offer and/or manage volunteers for activities directly related to conservation (in accordance to the conservation management entity's provisions);

e) Offer and/or manage edicational opportunities directly related to conservation and appropriate behaviour (in accordance to the conservation management entity's provisions);

f) Purchase of products of any kind (e.g. food, drinks, handcrafts etc.) for re-selling or for direct use derived from sustainable practices in the conservation area accredited by the management entity or other credible institution[677].

g) Purchase of merchandise from the conservation area for re-selling (or other commercial arrangement that guarantees revenue from selling of merchandise accrues to the conservation area);

h) Payment of copyrights (images, name etc.) directly to conservation areas management entity(ies);

i) Collect tourists voluntary donations to the conservation area management entity to be transferred to a dedicated fund/account set up by the conservation management entity on a regular basis;

j) Other direct or indirect forms of contribution to be defined in the contractual agreement (see below).

1A.2 - The enabling activities are defined in a specific **contractual agreement(s) (or equivalent)** between the operator of the activity and the conservation and/or restoration management entity. The agreement covers a minimum of **5 years** and is reviewed every year. It defines clearly time-bound targets for contribution to the conservation/ restoration area financial self-reliance with one or more of the forms described under criterion 1A.1. The enabling cactivities ontributions are eatimated in monetary terms and defined as the % of enabling contributions estimated value over the total yearly operating cost of the conservation/restoration area (*Value of enabling activities per year / Total yearly operating*

[677] In the case of Natura 2000 sites, the Natura 2000 logo can be used to certify goods and services. Vista - Search (cc.cec)

costs of the conservation area x 100). The % constribution so estimated and defined in the contractual agreement is equivalent to:

- **at least 1%** of the annual turnover of an individual tourist accommodation establishment, if the contractual agreement includes only **one** establishment.
- **at least 0.7%** of the annual turnover of an individual tourist accommodation establishment, if the contractual agreement or equivalent is collective and includes a group of **two to ten** establishments.
- **at least 0.5%** of the annual turnover of an individual tourist accommodation establishment, if the contractual agreement or equivalent is collective and includes a group of **over ten** establishments.

1A.3 - Additional requirements under Criterion 1A:

a) Mandatory financial contributions applied to the tourism activity in the context of the national/local regulatory framework (eco-taxes, tariffs etc.) are not considered enabling substantial contributions.

b) Conservation/Restoration offsets of impacts defined at the stage of formal authorisation of the tourism activity are not considered enabling substantial contributions.

c) Eligible conservation/restoration activities are aligned with taxonomy TECHNICAL SCREENING CRITERIA for both SC and DNSH.

OR

1B. Direct contributions

1B.1 - The activity has developed a **Biodiversity Management Plan** (or equivalent)[678] specific to the tourism service/offer provided, including all of the following conservation and/or restoration measures:

a) An analysis of Carrying Capacity or Limit of Acceptable Change of the area or equivalent[679] developed in coordination with the conservation management entity and approved by the management entity itself or, where applicable, by the comptenet authority;

b) A clear set of objectives and activities aimed at avoiding and/or minimising direct negative impacts to remain within the carrying capacity or limits of acceptable change identified under point a) and including one or more of the following as defined by the GSTC criteria[680]:

1. Visits to natural sites: Direct damage on ecosystems/habitats through management of tourist flows and movements

2. Wildlife interaction:

   i. Direct disturbance through detrimental actions: animal feeding, destruction or damaging eggs and nests, destruction of plants, etc.

   ii. Indirect disturbance on species (tourists local movements, littering, noise or light pollution)

   iii. Invasive species: Prevention of introduction of invasive species and use only local species for landscaping and restoration[681].

[678] CBD Guidance on protected areas and other effective areas-based conservation measures

[679] The UN World Tourism Organisation (UNWTO) proposes the following definition of the carrying capacity *«The maximum number of people that may visit a tourist destination at the same time, without causing destruction of the physical, economic, socio-cultural environment and an unacceptable decrease in the quality of visitors' satisfaction. »* (UNEP/MAP/PAP, 1997).

[680] GSTC Industry Criteria for Hotels and Accommodations (www.gstcouncil.org)

[681] The introduction of invasive alien species is prevented and/or their spread is managed in accordance with Regulation (EU) No 1143/2014. Outside of the EU reference is made to the national legislation and to the CBD

3. Wildlife harvesting and trade[682]: Protected wildlife species are not harvested, consumed, sold.

c) A clear breakdown of the funds and resources the establishment commits towards specific biodiversity management measures (recurrent management, infrastructure, equipment, etc.);

d) Where applicable, a description of partnership agreements with conservation management entities, local NGOs or communities to contribute to common conservation goals;

e) Where applicable, indication of how the management plan fits into existing conservation efforts at the level of the entire tourist destination[683], including research activities.

f) A biodiversity information and awareness plan linked to the specific impacts arising from tourism activities[684]

g) A clear framework for the continuous monitoring and measuring of performance and evaluation of effectiveness including an adaptive approach allowing for the identification of corrective actions where necessary[685].

Supplementary Voluntary Guidance for Avoiding Unintentional Introductions of Invasive Alien Species Associated with Trade in Live Organisms - 14/11. Invasive alien species (cbd.int)

[682] As defined and governed by Council Regulation (EC) 338/97 and Commission Regulation (EC) 865/2006 implemneting the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) within the EU. Outside of the EU reference is made to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

[683] See note 2 on definition of Tourism Destination.

[684] In line with the EU Ecolabel for tourist accommodation services Criterion 2a: The tourist accommodation shall provide environmental communication and education notices on local biodiversity, landscape and nature conservation measures to guests.

[685] Guiding principles for laid out in Chapter V (Monitoring) of the EU Better Regulation Guidelines can be used as a reference.

The activity may adopt a Biodiversity Management Plan existing at destination level, if appropriate, as long as all the elements mentioned above are included[686].

1B.2 - At the beginning of the activity and **every two years** thereafter, the compliance with the biodiversity management plan or equivalent instrument, is controlled by either the relevant national competent authorities or by an independent third-party certifier such as a dedicated certification/accreditation scheme, at the request of national authorities or the operator of the activity. The independent third-party certifier may not have any conflict of interest with the owner or the funder, and may not be involved in the development or operation of the activity. In order to reduce costs, audits may be performed together with any forest certification, climate certification or other audit.

AND

2. Environmental Management System

For all categories of accomodation establishments:

2.1 – The establishment has at least 40% of offered products (food and drink, furniture, souvenirs or others), by procurement value, certified according to environmental standards[687]. The establishment commits to a continuos improvement of at least 10% every 3 years to reach a minimum of 80% as proven by a third party verified certification.

AND, only for accomodation establishments with over 50 employees:

2.2 - The establishment has an environmental management system (EMS) requiring third party certification (EMAS, ISO 14001 or equivalent) aligned with best environmental

[686] A destination level BMP not covering all elements listed in criterion 1B.1 is integrated and adapted to fulfill the criterion in full.

[687] Commission Decision (EU) 2016/611 on best environmental management in the tourism sector indicates 60% of food and drink products by procurement value should be environmentally certified (Section 3.7.1 Green sourcing of food and drink products); and over 97% of all wood, paper and cardboard purchased by accommodations and restaurants are recycled or environmentally certified (ecolabelled, FSC, PEFC) (Section 3.1.2 Supply chain management). Nevertheless, it seems appropriate to lower the entry level and require a continuous improvement over time.

management practice and benchmark performances (EMAS Reference Document for the Tourism Sector[688] or equivalent national/international standard); OR

The establishment was awarded with an EN ISO 14024 type I ecolabel (such as the EU Ecolabel for Tourist Accomodation services) or an equivalent voluntary label meeting equivalent requirements[689].

3. Minimum requirements

3.1 For any accommodation establishment or associated facility an Environmental Impact Assessment (EIA) or screening has been completed in accordance with Directive 2011/92/EU[690]. Where an EIA has been carried out, the required mitigation and compensation measures for protecting the environment are implemented.

3.2 For sites/operations located in or near biodiversity-sensitive areas (including the Natura 2000 network of protected areas, UNESCO World Heritage sites and Key Biodiversity Areas, as well as other protected areas), an appropriate assessment[691], where applicable, has been conducted and based on its conclusions the necessary mitigation measures[692] are implemented.

3.3 Recreational hunting and fishing activities are allowed only if explicitly included as part of the conservation/management plan of the conservation area as established by the

[688] Commission Decision (EU) 2016/611

[689] In particular requirements include: following a multi-criteria approach; criteria are developed through an independent science-based process, are publicly available and go beyond what is required by legislation; it is based on impartial control procedure through third party verification.

[690] For activities in third countries, in accordance with equivalent applicable national law or international standards requiring the completion of an EIA or screening, for example, IFC Performance Standard 1: Assessment and Management of Environmental and Social Risks

[691] In accordance with Directives 2009/147/EC and 92/43/EEC. For activities located in third countries, in accordance with equivalent applicable national law or international standards, that aim at the conservation of natural habitats, wild fauna and wild flora, and that require to carry out (1) a screening procedure to determine whether, for a given activity, an appropriate assessment of the possible impacts on protected habitats and species is needed; (2) such an appropriate assessment where the screening determines that it is needed, for example IFC Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources.

[692] Those measures have been identified to ensure that the project, plan or activity will not have any significant effects on the conservation objectives of the protected area.

management entity and fishing activities are aligned with the taxonomy Technical Screening Criteria for both SC and DNSH.

Do no significant harm ('DNSH')	
(1) Climate change mitigation	For buildings built before 31 December 2020, the building has at least an Energy Performance Certificate (EPC) class C. As an alternative, the building is within the top 30% of the national or regional building stock expressed as operational Primary Energy Demand (PED) and demonstrated by adequate evidence, which at least compares the performance of the relevant asset to the performance of the national or regional stock built before 31 December 2020 and at least distinguishes between residential and non-residential buildings. For buildings built after 31 December 2020, the Primary Energy Demand (PED)[693] defining the energy performance of the building resulting from the construction does not exceed the threshold set for the nearly zero-energy building (NZEB) requirements in national regulation implementing Directive 2010/31/EU. The energy performance is certified by an Energy Performance Certificate (EPC).
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) …/… supplementing Regulation (EU) 2020/852.
(3) Sustainable use and protection of	DNSH as set out in Appending B of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.

[693] The calculated amount of energy needed to meet the energy demand associated with the typical uses of a building expressed by a numeric indicator of total primary energy use in kWh/m2 per year and based on the relevant national calculation methodology and as displayed on the Energy Performance Certificate (EPC).

water and marine resources	Environmental degradation risks related to preserving marine environment, in particular risk to the Good Environmental Status as defined in the Marine Strategy Framework Directive (Directive 2008/56/EC), are identified and addressed.
(4) Transition to a circular economy	The accommodation establishment: 1. Does not make any use or offers to its guests any of the items listed in Part B of Annex I to Directive (EU) 2019/904 on Single-use plastics[694]. 2. Separates at source paper, metal, plastic, glass and biowaste where separate collection for these materials is available in the area[695]. Has a food waste prevention plan with a specific time-bound quantitative target of reduction of food waste[696].
(5) Pollution prevention and control	DNSH as set out in Appending C of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852 The activity is in line with the Medium Combustion Plant Directive (2015/2193/EU).
Rationale	

[694] Annex I, Part B on Single-use plastic products covered by Article 5 on restrictions on placing on the market

[695] Only the materials for which the seprate collection exists need to be separated at source by the establishment.

[696] Food waste is defined under Art. 3 of the Directive (EU) 2018/851 amending Directive 2008/98/EC on waste

Rationale: Tourism, sports and leisure activities (tourism activities or sector in short) cover a very wide spectrum of activities in their value chain that range across very different sectors. EUROSTAT identifies 15 NACE codes as relevant to the Tourism industry[697]. In addition, several other NACE codes cover leisure activities and sports in various ways. All activities in the NACE classification related to tourism, sports and leisure activities that could lead to a direct impact on biodiversity have been identified and grouped in sub-categories in the definition provided below. The result of this analysis is the following list of NACE codes classifies by sub-activity in the tourism sector:

1. Hotels, holiday, camping grounds and similar accommodation

This activity is classified as part of 3 separate NACE codes (I5510, I5520 and I5530) according to the statistical classification of economic activities established by Regulation (EC) No.1893/2006

2. Food and beverage services

This activity is classified as part of 2 separate NACE codes (I5610 and I5630) according to the statistical classification of economic activities established by Regulation (EC) No.1893/2006

3. Renting and leasing of vehicles and goods used for recreational and sport purposes

This activity is classified as part of 3 separate NACE codes (I7711, I7712 and I7721) according to the statistical classification of economic activities established by Regulation (EC) No.1893/2006.

4. Tourism, sports and leisure activities management

This activity is classified as part of 7 separate NACE codes (79.12, 91.02, 91.03, 93.11, 93.19, 93.21 and 93.29) according to the statistical classification of economic activities established by Regulation (EC) No.1893/2006

Out of these 4 sub-groups the first was considred the most relevant in terms of potential biodiversity impact based on life-cycle considerations and was given priority. Technical

[697] https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Tourism_industries

Screening Criteria for the other sub-groups will have to be developed at a later stage, if appropriate.

Substantial Contribution: Tourism, sport and leisure activities are closely dependent on the condition of the natural/landscape assets that constitute the attraction for the final users. For most types of tourism, biodiversity contributes significantly to the attractiveness and quality of destinations, and therefore to their competitiveness. There is significant geographical overlap between tourism development (and growth) and biodiversity hotspots, as well as areas of low human development, as illustrated in a study by UNEP and Conservation International (CI)[698]. The value of biodiversity and the associated services provided by healthy ecosystems is extremely large for tourism. Market surveys have shown that 42% of European travellers, surveyed in 2000, included a visit to natural parks as part of their vacation activities. In England, tourism based on high quality natural environments is estimated to be worth £5 billion each year[699]. As a result, tourism sport and leisure activities have a vested interest and should have a more active and concrete role in maintaining the natural/landscape assets in good status (if not improving them). The relationship between sustainable tourism and biodiversity is simple: sustainable tourism should contribute to conservation of biodiversity[700]. Some tourism businesses are making important contributions by establishing commercial operations that are directly linked to conservation. Some others have developed tourism products that are specifically designed to support conservation, for example, by providing a share of income to specific conservation projects, and by maintaining a flow of tourists, and therefore income, to areas where income from tourism is a vital source of funding for conservation.

This is perfectly aligned with the Biodiversity Strategy 2030 indicating thet at least €20 billion a year should be unlocked for spending on nature to be able to finance all the proposed targets. This will require mobilising private and public funding at national and EU level, but the private sector needs to scale up its support and the tourism sector is ideally positioned to do this because of the mentioned dependency from natural assets.

[698] United Nations Environment Programme and Conservation International (2003), Tourism and Biodiversity – Mapping Tourism's Global Footprint, CI, Washington.

[699] Tourism and Biodiversity – Achieving Common Goals Towards Sustainability, UNWTO 2010

[700] Secretariat of the Convention on Biological Diversity (2007), Managing Tourism and Biodiversity, User's Manual on the CBD Guidelines on Biodiversity and Tourism Development, Secretariat of the CBD, Montreal, p.12.

In addition, the Technical Screening Criteria have been developed in alignment with the Global Sustainable Tourism Council (GSTC) criteria for biodiversity. The GSTC establishes and manages global standards for sustainable travel and tourism, known as the GSTC Criteria. These are the guiding principles and minimum requirements that any tourism business or destination should aspire to reach in order to protect and sustain the world's natural and cultural resources, while ensuring tourism meets its potential as a tool for conservation and poverty alleviation.Tthe GSTC criteria for biodiversity include:

a. The organization demonstrates awareness of natural protected areas and areas of high biodiversity value.
b. The organization provides and records monetary support for biodiversity conservation in the local area.
c. The organization provides and records in-kind or other support for biodiversity conservation in the local area.
d. The property is actively managed to support biodiversity conservation.
e. The organization is aware of, and mitigates, activity with potential to disturb wildlife and habitats.
f. Compensation is made where any disturbance has occurred.
g. Action is taken to encourage visitors to support biodiversity conservation.
h. The organization engages with local conservation NGOs.

As a result of the rationale above, Technical Screening Criteria have been developed based on the principle that the connection between tourism/sport/leisure activities and the natural/landscape assets representing the tourist attraction to an area should be symbiotic. In other words, there should be a mutual sharing of benefits and not a one directional exploitation of natural/landscape assets for profit making. This can happen at different levels depending on the type of economic activity:

1. **Enabling SC (Criterion 1A)**: The activity can indirectly enable conservation/restoration activities implemented by other entities (e.g. protected areas)

2. **Own Performance SC (Criterion 1B)**: The activity can play an active role in reducing the pressure directly linked to tourists interaction with biodiversity and ecosystems (e.g. trempling, littering, harvesting etc.)

3. **Own Performance SC (Criterion 2)**: The activity can play an active role in reducing the pressure on biodiversity and ecosystems indirectly linked to tourism facilities (e.g. water consumption, waste disposal, use of chemicals)

4. **Enabling SC (Criterion 2)**: The activity can indirectly enable conservation by chosing to source its materials from sustainable sources (e.g. organic products, FSC certified furniture etc.)

All these elements are captured in the proposed Technical Screening Criteria in a way that they can be combined to fit the different profiles of an economic activity from the large hotel chain to the small family operation.

The enabling contribution under criterion 1A is described in qualitative terms but quantified financially in proportion to the turnover of the tourist accommodation establishment and a threshold is indicated to determine substantial contribution. Based on the EUROSTAT data for the period 2015-2018 the average turnover of tourist accommodation establishments (NACE code I55) is presented in the table below. The simple application of a 1% SC threshold on the annual turnover has the potential to generate substantial direct or indirect financial support to the conservation area management entity. Most of the enabling activities listed under criterion 1A are in reality in-kind contributions and make use of the tourist establishment as a catalyst in support of the revenue generating mechanisms of the conservation area management entity itself.

The SC threshold is relatively low per individual establishment (1%) but an incentive is provided for establishments to coordinate their efforts. The higher the number of establishments under the same agreement, the lower the individual contributions of each establishment (0.7% between 2 and 10; 0.5% over 10 establishments). This is a key feature of the Technical Screening Criteria as the real contribution to conservation can only emerge from an aggregation of individual establishments at destination level. Based on a conservative estimate, a group of 10 establishments can generate an average 138 000 Euros per year (3 SMEs of each size class x their respective 0.5% contribution = 138 000 Euros).

Business Size	**Average Annual Turnover (MEuro)**	**1% contribution (Euro)** ***Single Est.***	**0.7% contribution (Euro)** ***2-10 Est.***	**0.5% contribution (Euro)** ***>10 Est.***
Large Enterprise* - 250 persons employed or more	50	500 000	350 000	250 000

Macro SME - From 50 to 249 persons employed	7	70 000	49 000	35 000
Medium-size SME - From 20 to 49 persons employed	2	20 000	14 000	10 000
Micro SME - From 2 to 9 persons employed	0.2	2 000	1 400	1 000

Source: Elaborated from EUROSTAT - Accommodation and food service statistics - NACE Rev. 2 - Statistics Explained (europa.eu)

***Note**: Figures provided for Large Enterprises are likely to be overestimated in the table, because Large Enterprises more likely to own and/or operate several accommodation estanlishments in the same or in different locations. In this case, only the turnover of the individual establishment of relevance to the conservation area will be used as a basis for the estimate in the contractual agreement with the conservation management entity.

In relation to the requirements in art. 19 of the Taxonomy Regulation (EU) 2020/852 (:

- **Policy coherence**: The logic of the Technical Screening Criteria proposed is aligned with the Biodiversity Strategy 2030 indicating that the private sector needs to scale up its financial support and the tourism sector is ideally positioned to do so because of the mentioned dependency from natural assets. Best practice guidance and criteria related to the environmental performance of tourism emphasise the important role that tourism should play in biodiversity protection, both et EU level (EU Ecolabel for Tourism[701] and Best Environmental Management Practise in the Tourism Sector[702]) and at international level (Global Sustainable Tourism Council criteria).

- **Environmental ambition and integrity**: The different criteria required to determine a substantial contribution can be combined in two ways but both require a concrete direct or indirect contribution to conservation/restoration activities, the presence of an

[701] Commission Decision (EU) 2017/175 on establishing EU Ecolabel criteria for tourist accommodation indicates several criteria related to biodiversity, notably:

- Criterion 26.a - The tourist accommodation shall provide environmental communication and education notices on local biodiversity, landscape and nature conservation measures to guests
- Criterion 50 - Native or non-invasive alien species used in outdoor planting

[702] Commission Decision (EU) 2016/611 on the reference document on best environmental management practice, sector environmental performance indicators and benchmarks of excellence for the tourism sector indicates that best environmental management practice is to monitor the state of biodiversity within the destination, and to implement a biodiversity conservation and management plan that protects and enhances total biodiversity within the destination and at individual establishment level.

environmental management system to ensure indirect impacts on biodiversity (water use, waste production, use of chemicals) are minimised or a greening of the supply chain of food and other products used in large quantities by accommodation establishments. Both combinations are considered to require a considerable effort to the estabishments and sufficient to determine that the activity is making a substantial contribution. The quantitative threshold proposed for supply chain local or environmentally certified producst are in line with existing practice and have generally been kept lower than the existing benchmark values for best environmental practice (Commission Decision (EU) 2016/611 on best environmental management in the tourism) as it seems appropriate to lower the entry level and require a continuous improvement over time.

- **Level playing field**: All the elements are captured in the proposed Technical Screening Criteria in a way that they can be combined to fit the different profiles of an economic activity from the large hotel chain to the small family operation. As indicated above, criterion 1A is proportional to the size of the establishment by design. Criterion 1B is more suited to large enterprises that manage directly tourist flows and are in close proximity to natural assets. Criterion 2 (EMS) and/or 2B (supply chain) are approaches increasingly used on a voluntary basis by many tourist establishments as part of their CSR strategy. The size-based approach used in Criterion 2 is justified because an EMS is resource intensive and is not an easy option to implement for micro or medium-size SMEs, while supply chain considerations can be easily made at any scale. Clearly accommodation establishments that are in proximity of a conservation/restoration area (e.g. Protected Area) have more to benefit from the natural assets that attract the tourists and have greater opportunity for contribution. But even establishments in a urban/semi-urban context have opportunities that can be exploited (e.g. support to city parks). This simply reflects the different level of dependency of the establishment from natural assets that underpins the logic of the Technical Screening Criteria.

- **Usability of the criteria**: Criteria are applicable to any context and type of tourist accommodation establishment. The fulfilment of the criteria is easily verified on the basis of specific documents that have to be produced by the stablishment or a third party certification entity.

DNSH: The criteria used reflect the standard wording used in the Appendixes to the Annex I to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852,

with the exception of Climate Change Mitigation, Water, Circular Economy and Pollution prevention and control.

- Climate Change Mitigation: energy efficiency in buildings is particularly relevant for the tourism accommodation sector and criteria used in the DA are reproposed here;

- Water: reference is added to the Marine Strategy Framework Directive and the need to maintain Good Environmental Status with the same wording used for the WFD.

- Circular Economy: Use of disposable items and food waste are important elements to be considered in the torusism sector. The most relevant legal framework in these areas is included in two recent Directives which are currently entering into force (Directive (EU) 2019/904 on Single-use plastics and the Directive (EU) 2018/851on waste).

Pollution prevention and control: A reference to compliance with the Medium Combusion Plants Directive was added as particularly relevant for tourist accommodation establishments in relation to sir pollution control.

11. Water supply

11.1 Water supply

Description of the activity

This activity covers the abstraction of the water resource, the necessary treatment to make the water compliant according to the relevant legislation and the distribution to the population and water consumers in piped systems in a safe and resource efficient way. This requires construction works, operational activities and maintenance works, including the upgrading of equipment and methods. Water supply is based on the abstraction of natural resources of water from surface or ground water sources.

Water for irrigation is not included in this activity. The abstraction of water resources from desalination of marine or brackish water is excluded from this activity

The economic activities in this category could be associated with several NACE codes, in particular E36.00 and F42.99 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

Substantial contribution to sustainable use and protection of water and marine resources

- For the **construction and operation of a new** water supply system or **an extension** of an existing water supply system to provide water supply for new areas where a water supply system was not present or not sufficient before. It will increase local consumers' access to water and the SC is achieved by:
    - The new (or extension of) water supply system will comply with the contamination parameters and quality parameters required as per the current Drinking Water Directive and the revised Directive (Directive (EU) 2020/2184).
    - The system will be included in a water use and resource management plan, securing local water resource management and governance by relevant authorities. This plan will be consistent with the relevant River Basin Management Plan referring to the requirements of the Water Framework Directive or any other

relevant plan at river basin level, also established by the competent authorities in water management.

- The leakage level of the new or extension system is either calculated using the Infrastructure Leakage Index (ILI)[703] rating method and the threshold value equals to or is lower than **1.5**, or is calculated using another appropriate method and the threshold value is established in accordance with Article 4 of Directive (EU) 2020/2184 of the European Parliament and of the Council[704]. That calculation is to be applied across the extent of water supply (distribution) network where the works are carried out, i.e. at water supply zone level, district metered area(s) (DMAs) or pressure managed area(s) (PMAs).

- The water supply systems will include metering at consumer level.

- **For renewal** of existing water supply systems the technical screening criteria for substantial contribution is met by closing the gap by at least 20% either between the current leakage level averaged over three years, calculated using the Infrastructure Leakage Index (ILI) rating method and an ILI of 1.5, or between the current leakage level averaged over three years, calculated using another appropriate method, and the threshold value established in accordance with Article 4 of the revised Drinking Water Directive. The current leakage level averaged over three years is calculated across the extent of water supply (distribution) network where the works are carried out i.e., for the renewed water supply (distribution) network at district metered area(s) (DMAs) or pressure managed area(s) (PMAs).

For renewal of existing water supply systems, a plan with goals and timelines for implementing metering at consumer level (if it does not already exists) must be issued by the water supplier in collaboration with relevant authorities.

[703] The Infrastructure Leakage Index (ILI) is calculated as current annual real losses (CARL)/unavoidable annual real losses (UARL): The current annual real losses (CARL) represent the amount of water that is actually lost from the distribution network (i.e. not delivered to final users). The unavoidable annual real losses (UARL) take into consideration that there will always be some leakage in a water distribution network. The UARL is calculated based on factors such as the length of the network, the number of service connections and the pressure at which the network is operating.

[704] Directive (EU) 2020/2184 of the European Parliament and of the Council of 16 December 2020 on the quality of water intended for human consumption (recast) (OJ L 435, 23.12.2020, p. 1).

Do no significant harm ('DNSH')

(1) Climate change mitigation	N/A
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.
(4) Transition to a circular economy	N/A
(5) Pollution prevention and control	N/A
(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appending D of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.

Rationale

Construction and operation of a green field water supply systems has for centuries been known as a measure by its nature to make a substantial contribution to the protection of human health. As it is recognized in the Taxonomy Regulation (EU) 2020/852, a significant contribution to the Objective "Sustainable use and protection of water and marine resources" is achieved by "*protecting human health from the adverse impact of any contamination of water intended for human consumption by ensuring that it is free from any micro-organisms, parasites and*

substances that constitute a potential danger to human health as well as increasing people's access to clean drinking water."

Rationale for Technical Screening Criteria:

The approach in SC is based on the nature of the activity to supply drinking water and to preserve the ability to deliver over time and through periods of drought and to protect human health by *avoiding contamination.*

A water supply system that is fulfilling the water quality requirements of the current Drinking Water directive and the revised directive (Directive (EU) 2020/2184) aims at achieving Substantial Contribution by protecting human health from the adverse effects of any contamination of water intended for human consumption and ensures that it is wholesome and clean. In addition, it is necessary to contribute to the management of the water resource in the area thus the water supply system must be consistent with a water use and resource management plan and a River Basin Management Plan following the Water Framework Directive. This requirement is in line with the overall ambition level for the Objective "Sustainable use and protection of water and marine resources".

River Basin Management Plans are a tool to protect and manage water resources, ensuring that the use is sustainable. Water supply systems must act according to a water resource management plan that also refers to a local river basin management plan to fulfill local requirements. A green field water supply installation will contribute to the management of the water resource in the area covered by a river basin management plan according to the Water Framework Directive, by adapting to the requirements in this plan for the use of the water resource. This will also apply for extensions of existing water supply systems to areas formerly not supplied by such distribution systems.

In order to achieve a sustainable use of water resources a **low leakage rate** is crucial. Rehabilitation and updates of existing water supply installations can contribute significantly by reducing abstraction and pressure levels in the water resources via reduced leakage from pipes and reduced energy consumption.

As set out in the document "JRC Best Environmental Management Practice for the Public Administration Sector. 2019"[705], the benchmark of excellence in the leakage level is an Infrastructure Leakage Index[706] (ILI) lower than 1.5. As per the Drinking Water Directive other indicators can be used to quantify the leakage levels in a system. The threshold of 20% reduction of the gap is set as a consistent approach with the threshold included in the *delegated act on sustainable activities for climate change adaptation and mitigation*. A 20% reduction in the gap will produce ambitious reduction of the leakage and a significant increase of the system´s efficiency. A low leakage rate will also reduce the probability for contamination of the water supply.

In existing water supply systems, it is important to have both situations in mind. An extension of a water supply system may require an upgrading of other, up-stream parts of the supply system. A renewal of an existing water supply system can vary from a situation similar to the construction of a new system to the renewal of just some parts of the technical system depending on the state of the water supply before renewal. When the renewal can be considered similar to a new supply system, the criteria for that activity applies.

In the context of a protection of the water resources, metering of water consumption can lead to reduced water consumption by the user. Metering at consumer level creates the dataset-background for a just payment scheme for water consumption and it is a tool to calculate the ILI. Likewise, the data set will create a just cost-recovery scheme for the water supply utilities in collaboration with relevant authorities. To install water meters for each residential unit and any other individual final user (industrial plant, commercial building, public building, etc.) is according to JRC (refer to footnote no. 7) a crucial measure to reduce leaks and water consumption.

[705] Best Environmental Management Practice for the Public Administration Sector | EU Science Hub. https://ec.europa.eu/jrc/en/publication/best-environmental-management-practice-public-administration-sector

[706] The Infrastructure Leakage Index (ILI) is calculated as current annual real losses (CARL)/unavoidable annual real losses (UARL): The current annual real losses (CARL) represent the amount of water that is actually lost from the distribution network (i.e. not delivered to final users). The unavoidable annual real losses (UARL) take into consideration that there will always be some leakage in a water distribution network. The UARL is calculated based on factors such as the length of the network, the number of service connections and the pressure at which the network is operating

Rationale for Do No Significant Harm criteria:

The DNSH criteria are assessed in order to secure water supply against climate change, as water supply by nature is not a polluting activity. The impacts of the supply facility on the environment takes into account the first Climate Delegated Act supplementing Regulation (EU) 2020/852. However in terms of “Pollution prevention and control”, it is recognized that water supply is a source of wastewater once it is used, however this is usually addressed by the EIA and the wastewater treatment legislation, so it is not necessary to add specific DNSH criteria about this topic.

No additional Screening Criteria are proposed for the construction part of the activity since the substantial contribution is achieved by the operation of the water supply facilities (e.g. intakes, treatment plants, distribution pipes). However, the operation cannot be achieved without the construction of the facilities. It is also understood that the DNSH criteria described above and in particular the fulfilment of the EIA Directive include all the necessary mitigation measures for the possible impacts during the construction phase.

11.2 Desalination

Description of the activity

The activity covers the construction and operation of desalination plants where the desalination process takes place in order to produce water to be distributed in drinking water supply systems where the water resources are or will be impacted by the effects of climate change, thus **enabling** the activity ‘*Water Supply*‘.

Desalination plants usually include abstraction, pre-treatment (e.g. designed to remove contaminants, scale formation or membrane fouling), treatment (e.g. reverse osmosis, or ‘RO’), post-treatment (disinfection and conditioning) and storage of processed water. Finally, the activity covers the disposal of brine (reject water), which usually is accomplished by means of deep sea pipes or outflows providing sufficient dilution. For plants located on more inland sites (such as for brackish water desalination), brine discharge techniques may differ.

Increasingly, desalination plants are complemented with facilities for renewable energy generation such as photovoltaic plants or wind turbines, in order to attenuate the energy demand from the grid although their contribution to the total energy consumption still remains

low. These facilities are also considered part of the activity when the purpose of power generation is to supply the plant.

The activity is not classified under any NACE code.

The distribution of the desalinated water is excluded in this activity as it is covered by the activity '*Water Supply*'.

Desalination may be applied to waters with varying levels of salinity. Currently, the most common process applied is RO (reverse osmosis using membrane technology).

Substantial contribution to Climate change adaptation.

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1. The economic activity has implemented physical and non-physical solutions ('adaptation solutions') that substantially reduce the most important physical climate risks that are material to that activity.

2. The physical climate risks that are material to the activity have been identified from those listed in Appendix A to the Annex II of the first Climate Delegated Act supplementing Regulation (EU) 2020/852 by performing a robust climate risk and vulnerability assessment with the following steps:

(a) screening of the activity to identify which physical climate risks from the list in Appendix A to the Annex II of the first Delegated Act may affect the performance of the economic activity during its expected lifetime;

(b) where the activity is assessed to be at risk from one or more of the physical climate risks listed in Appendix A to the referred Annex, a climate risk and vulnerability assessment to assess the materiality of the physical climate risks on the economic activity;

(c) an assessment of adaptation solutions that can reduce the identified physical climate risk.

The climate risk and vulnerability assessment is proportionate to the scale of the activity and its expected lifespan, such that:

(a) for activities with an expected lifespan of less than 10 years, the assessment is performed, at least by using climate projections at the smallest appropriate scale;

(b) for all other activities, the assessment is performed using the highest available resolution, state of-the-art climate projections across the existing range of future scenarios[707] consistent with the expected lifetime of the activity, including, at least, 10 to 30 years climate projections scenarios for major investments.

3. The climate projections and assessment of impacts are based on best practice and available guidance and take into account the state-of-the-art science for vulnerability and risk analysis and related methodologies in line with the most recent Intergovernmental Panel on Climate Change reports[708], scientific peer-reviewed publications and open source[709] or paying models.

4. The adaptation solutions implemented:

(a) do not adversely affect the adaptation efforts or the level of resilience to physical climate risks of other people, of nature, of cultural heritage, of assets and of other economic activities;

(b) favour nature-based solutions[710] or rely on blue or green infrastructure[711] to the extent possible;

(c) are consistent with local, sectoral, regional or national adaptation plans and strategies;

[707] Future scenarios include Intergovernmental Panel on Climate Change representative concentration pathways RCP2.6, RCP4.5, RCP6.0 and RCP8.5

[708] Assessments Reports on Climate Change: Impacts, Adaptation and Vulnerability, published periodically by the Intergovernmental Panel on Climate Change (IPCC), the United Nations body for assessing the science related to climate change produces, https://www.ipcc.ch/reports/.

[709] Such as Copernicus services managed by the European Commission.

[710] Nature-based solutions are defined as 'solutions that are inspired and supported by nature, which are cost-effective, simultaneously provide environmental, social and economic benefits and help build resilience. Such solutions bring more, and more diverse, nature and natural features and processes into cities, landscapes and seascapes, through locally adapted, resource-efficient and systemic interventions'. Therefore, nature-based solutions benefit biodiversity and support the delivery of a range of ecosystem services (version of [adoption date]: https://ec.europa.eu/info/research-and-innovation/researcharea/environment/nature-based-solutions_en/).

[711] See Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Green Infrastructure (GI) –Enhancing Europe´s Natural Capital (COM/2013/0249 final)

(d) are monitored and measured against pre-defined indicators and remedial action is considered where those indicators are not met;

(e) where the solution implemented is physical and consists in an activity for which technical screening criteria have been specified in this Annex, the solution complies with the do no significant harm technical screening criteria for that activity.

5. In order for an activity to be considered as an enabling activity as referred to in Article 11(1), point (b), of Regulation (EU) 2020/852, the economic operator demonstrates, through an assessment of current and future climate risks, including uncertainty and based on robust data, that the activity provides a technology, product, service, information, or practice, or promotes their uses with one of the following primary objectives:

(a) increasing the level of resilience to physical climate risks of other people, of nature, of cultural heritage, of assets and of other economic activities;

(b) contributing to adaptation efforts of other people, of nature, of cultural heritage, of assets and of other economic activities.

Do no significant harm ('DNSH')

(1) Climate change mitigation	The desalination plant will have a high performance in terms of greenhouse gas emissions: • Less than 1080 gCO2e/m3 of freshwater produced. This value is obtained from the average consumption of desalination plants (World Bank 2019[712] and 2021 EC Blue Economy Report[713]) in terms of net energy consumption (4 kwh/m3) and the indirect emission threshold included in the delegated act for DNSH mitigation (270 gCO2e/kwh) in manufacturing activities. The value covers all the

[712] The Role of Desalination in an Increasingly Water Scarce World. March 2019. World Bank Document

[713] The EU Blue Economy report 2021 (europa.eu)

	desalination process (even the discharge of brine) but not the distribution of the product water. Net energy consumption may take into account measures decreasing energy consumption such as energy generation (hydraulic, solar and wind energy, for example).
(3) Sustainable use and protection of water and marine resources	The desalination plant is included in a water management plan and/or drought management plan at river basin scale, validated by the relevant Competent Authority in relation to Water Management. The Plan must demonstrate that all efficiency and demand management measures, including measures to improve water efficiency, reduce per capita consumption, reduce network losses and other non-revenue water, have been fully considered and found to be insufficient to address the gap between supply and demand, and that no environmentally better alternatives (such as water reuse) are available. Environmental degradation risks related to preserving water quality and avoiding water stress are identified and addressed with the aim of achieving good water status (including marine water) and good ecological potential as defined in Article 2, points (22) and (23), of Regulation (EU) 2020/852, in accordance with Directive 2000/60/EC of the European Parliament and of the Council[714] and a water use and protection management plan, developed thereunder for the potentially

[714] Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy (OJ L 327, 22.12.2000, p. 1). For activities in third countries, in accordance with applicable national law or international standards which pursue equivalent objectives of good water status and good ecological potential, through equivalent procedural and substantive rules, i.e. a water use and protection management plan developed in consultation with relevant stakeholders which ensures that 1) the impact of the activities on the identified status or ecological potential of potentially affected water body or bodies is assessed and 2) deterioration or prevention of good status/ecological potential is avoided or, where this is not possible, 3) justified by the lack of better environmental alternatives which are not disproportionately costly/technically unfeasible, and all practicable steps are taken to mitigate the adverse impact on the status of the body of water

	affected water body or bodies, in consultation with relevant stakeholders. An Environmental Impact Assessment or screening is carried out in accordance with Directive 2011/92/EU of the European Parliament and of the Council[715] and includes an assessment of the impact on water and marine water in accordance with Directive 2000/60/EC, and to the EU Marine Strategy Framework Directive (2008/56/EC). The required mitigation and compensation measures for protecting the environment are implemented. The EIA will include a site-specific assessment of impacts relative to brine marine disposal based on: (i) description and understanding of the local baseline conditions (e.g. seawater quality, topography, hydrodynamic characteristics, and marine ecosystems based on field measurements and surveys), (ii) dispersion modelling of the brine discharge and (iii) laboratory toxicity testing. The level of detail required in the assessment must be appropriate to the size, process and recovery rates of the desalination plant, as well as its location since potential adverse impacts are site-specific.
(4) Transition to a circular economy	N/A
(5) Pollution prevention and control	N/A

[715] Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment (OJ L 26, 28.1.2012, p. 1).

(6) Protection and restoration of biodiversity and ecosystems	An Environmental Impact Assessment (EIA) or screening[716] has been completed in accordance with Directive 2014/52/EU amending 2011/92/EU[717] . Where an EIA has been carried out, cumulative impacts have to be addressed from existing and planned projects and the required mitigation, restoration and/or compensation measures for protecting the environment are implemented. For sites/operations located in or near biodiversity-sensitive areas (including the Natura 2000 network of protected areas, UNESCO World Heritage sites, Marine Protected Areas, and Key Biodiversity Areas, as well as other protected areas), an appropriate assessment[718], where applicable, has been conducted and based on its conclusions the necessary mitigation measures[719] are implemented. It will be ensured as well that the activity will: 1. Comply with Articles 16 and 6.3 and 6.4 of the Habitats Directive and Article 3 and 4 of the Birds Directive, Article 4 of the Water Framework Directive, the Invasive Alien Species Regulation (Regulation (EU) No 1143/2014) and the respective national environmental law.

[716] The procedure through which the competent authority determines whether projects listed in Annex II to Directive 2011/92/EU is to be made subject to an environmental impact assessment (as referred to in Article 4(2) of that Directive).

[717] For activities in third countries, in accordance with equivalent applicable national law or international standards requiring the completion of an EIA or screening, for example, IFC Performance Standard 1: Assessment and Management of Environmental and Social Risks

[718] In accordance with Directives 2009/147/EC and 92/43/EEC. For activities located in third countries, in accordance with equivalent applicable national law or international standards, that aim at the conservation of natural habitats, wild fauna and wild flora, and that require to carry out (1) a screening procedure to determine whether, for a given activity, an assessment on the likely significant effects on protected habitats and species is needed; (2) such an assessment where the screening determines that it is needed, for example IFC Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources.

[719] Those measures have been identified to ensure that the project, plan or activity will not have any significant effects on the conservation objectives of the protected area.

	2. Be consistent with national, regional or local river basin management strategies and plans. 3. Comply with the EU Marine Strategy Framework Directive (2008/56/EC)[720] and Maritime Spatial Planning directive (2014/89/EU)[721] 4. Include a site-specific minimum brine dilution objectives (taking into account salt concentration, total alkalinity, temperature and toxic metals) based on an appropriate characterization of local water conditions and ecosystems and species, in order to mitigate the possible adverse effects of brine disposal so as not to adversely impact on the good environmental status of the marine environment.

Rationale

Rationale for the Technical Screening Criteria:

According to the *2021 EU Strategy on Adaptation to Climate Change*, "Due to the changing climate, many European regions are already facing more frequent, severe, and longer lasting droughts". In addition, the EU Strategy recognizes that *"Climate change also threatens water quality. A stable and secure supply of drinking water is of highest importance and it must be guaranteed. Climate change will increase the risk of contamination and acute pollution of freshwater due to impacts such as low river flows, increased water temperatures, flooding, and forest loss".*

Climate change is endangering water resources. Water scarce countries are suffering the effects of climate change, such as increased evapotranspiration, and extended and more

[720] Law - EU Coastal and Marine Policy - Environment - European Commission. https://ec.europa.eu/environment/marine/eu-coast-and-marine-policy/marine-strategy-framework-directive/index_en.htm

[721] EUR-Lex - 32014L0089 - EN - EUR-Lex. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32014L0089

frequent droughts. These effects can amplify the scarcity of water thus jeopardising water supply and leading to an overexploitation of and increased competition for groundwater and surface water resources.

To date, about 20,000 desalination plants in more than 150 countries supply fresh water to more than 300 million people. By January 2021, there were 2,309 operational desalination plants in the EU producing about 9.2 million cubic meters per day (m3/day, 3,352 million m3/year) of fresh water, mainly from seawater and brackish water[722].

This technology allows fresh water to be obtained from the sea, estuaries, or brackish deep wells by passing the raw water through a process (e.g. RO), thereby obtaining freshwater and reject water (brine) — the latter is usually discharged back into the raw water source (such as the sea or deep wells). Desalination plants are a reliable water source that are usually energy-intensive procedure in order to produce freshwater.

The construction and operation of desalination plants can make a substantial contribution to the objective 'Climate change adaptation' by helping the countries/areas to increase their water resources, thus **enabling** the activity related to water supply by increasing the level of resilience to the system, when their existing ones are jeopardized by the effects of climate change (e.g. increased droughts and evapotranspiration).

As desalination plants are a reliable water source, they will avoid the overexploitation of existing water resources by creating a new resource. The Activity has SC to Climate change Adaptation as **enabling** the activity '*Water Supply*' since it increases the level of resilience of this activity. In order to achieve this, the activity relies on the Technical Screening Criteria included in the first delegated act in relation to substantial contribution to Climate Change Adaptation since are considered valid for the activity.

Rationale for the Do No Significant Harm criteria:

As desalination is energy-intensive with risks of other environmental impacts, it should be carefully considered in an option analysis with the aim of avoiding overexploitation of the existing water resources, which should also include demand management and water reuse as

[722] The EU Blue Economy report 2021 (europa.eu)

possible options. The *2007 Commission Communication on Water Scarcity and Droughts*[723] and the 2012 Commission Communication *A Blueprint to Safeguard Europe's Water Resources*[724] proposed a water hierarchy whereby additional water supply options such as desalination are only considered after all other improvements in efficiency on the demand side are exhausted.

The desalination option will be the last solution or the only feasible solution as an outcome of the water management plans and/or drought management plans where climate change scenarios are included in the risk analyses. All efficiency and demand management measures (including measures to improve water efficiency, reduce per capita consumption, reduce network losses and other non-revenue water) should have been fully considered and found to be insufficient to address the gap between supply and demand, and that no environmentally better alternatives (such as demand management) are available. This is incorporated in the DNHS for water as a condition to be fulfilled.

DNSH to water, pollution and Biodiversity are addressed by sufficient EIAs according to **all EU legislation** (not only the EIA Directive), and the impact of the brine discharge must be assessed and mitigated. Desalination plants are not regulated by the IED (Industrial Emissions Directive). To be noted that to prevent causing Significant Harm to Biodiversity, compliance with the EIA Directive (which is used as a DNSH criterion in the first climate Delegated Act) is not considered sufficient enough mainly due to the following reasons:

- It does not necessarily capture the landscape (ecosystem) based scale. This can be achieved via compliance with the SEA directive. The WFD (Water Framework Directive) also applies the river basin scale, which is a more integrated approach.
- It does not apply to all size projects whereas the Habitats Directive and Birds Directive do.
- It does not include guidelines applicable to the marine ecosystems whereas the Marine Strategy Directive (2008/56/EC) currently does.

In relation to pollution, Desalination plants are not regulated by the IED (Industrial Emissions Directive). The possible harmful effects of pollution are addressed by the fulfilment of **all EU**

[723] EUR-Lex - 52007DC0414 - EN - EUR-Lex (europa.eu)

[724] EUR-Lex - 52012DC0673 - EN - EUR-Lex (europa.eu)

legislation including the EU Marine Strategy Framework Directive (2008/56/EC) and Maritime Spatial Planning directive (2014/89/EU).

The DNSH to mitigation is studied in terms of maximum emissions per produced m3 of water using average energy consumption for RO plants, which is the technique that demands less energy (if compared with Multi Effect Distillation of Multi Flash Distillation). For defining the average consumption the following scientific base was utilized: World Bank Report 2019: RO consumption range (3-7 Kwh/m3). EC, Blue Economy Report 2021: RO consumption range (3-5 Kwh/m3). In order to calculate the maximum emissions per produced m3, the emission threshold included in the first Climate Delegated Act supplementing Regulation (EU) 2020/852 for 'manufacturing' activities (270 gCO2e/kwh) is utilized since desalination plants can be considered as industries for producing drinking water. The value covers all the desalination process (even the discharge of brine) but not the distribution of the product water. The distribution of the desalinated water is excluded in this value as it is covered by the activity '*Water Supply*'.

No additional Screening Criteria are proposed for the construction part of the activity since the effect of 'enabling' is achieved by the operation of the desalination plants. However, the operation cannot be achieved without the construction of the facilities. It is also understood that the DNSH criteria described above include all the necessary mitigation measures for the possible impacts during the construction phase.

12. Sewerage

12.1 Urban Wastewater Treatment

Description of the activity

The generic activity '*Urban Wastewater Treatment*' refers to the construction, extension, rehabilitation, upgrade and operation of urban wastewater infrastructures such as (not an exhaustive list): treatment plants, sewer network, stormwater management structures, connections, on-site sanitation facilities, and outflows; as well as innovative and advanced treatment to meet environmental requirements that are not yet encompassed in EU Law, such as the removal of micropollutants.

The economic activities in this category could be associated with several NACE codes, in particular E37.00 and F42.9, in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

Substantial contribution to sustainable use and protection of water and marine resources

The wastewater treatment system complies with all the following criteria:

1. The wastewater treatment system is included in a River Basin Management Plan (RBMP), or a similar overarching water management plan, and fulfils the discharge requirements set up by the local authorities.

2. The wastewater treatment system fulfils the relevant, size-specific criteria set out in requirements for discharges from urban wastewater treatment plants subject to Articles 4 and 5 of the Urban Waste Water Treatment Directive[725] (UWWTD- Council Directive 91/271/EEC of 21 May 1991 concerning urban waste-water treatment).

[725] Council Directive 91/271/EEC of 21 May 1991 concerning urban waste-water treatment (OJ L 135, 30.5.1991, p. 40)

3. If the wastewater treatment plant has a capacity of 100,000 PE or more, or of a daily inflow BOD5 load of more than 6,000 kg, it will use anaerobic digestion to stabilize the sludge enabling the subsequent generation of sewage gas.

Do no significant harm ('DNSH')

(1) Climate change mitigation	An assessment of the direct GHG emissions from the centralised wastewater system, including collection (sewer network) and treatment, has been performed. The results are disclosed to investors and clients on demand.
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852
(4) Transition to a circular economy	N/A
(5) Pollution prevention and control	Discharges to receiving waters meet the requirements laid down in Council Directive 91/271/EEC[726] or as required by national provisions stating maximum permissible pollutant levels from discharges to receiving waters. Appropriate measures have been implemented to avoid and mitigate harmful stormwater overflows from the wastewater collection system, which may include nature-based solutions, separate stormwater collection systems, retention tanks and treatment of the first flush. Sewage sludge is used in accordance with Council Directive

[726] Council Directive 91/271/EEC of 21 May 1991 concerning urban waste-water treatment (OJ L 135, 30.5.1991, p. 40)

	86/278/EEC[727] or as required by national law relating to the spreading of sludge on the soil or any other application of sludge on and in the soil.
(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appending D of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852

Rationale

Wastewater is the water that has been used in households, businesses, factories, etc. More specifically, urban wastewater is the domestic wastewater (wastewater from households) or the mixture of domestic wastewater with industrial wastewater and/or run-off rainwater[728].

Wastewater treatment systems may include sustainable urban drainage systems (SUDS) to tackle certain challenges (e.g. reducing the rainwater run-off, increasing rainwater infiltration, post treatment). Due to SUDS being distinctively different from common wastewater treatment systems, they are handled in a separate form.

Wastewater contains pollutants such as pathogens, organic carbon (measured in terms of TOC, BOD, COD), suspended solids, Nitrogen (TN), Phosphorous (TP), metals, and contaminants of emerging concern such as microplastics and micropollutants.

The physical, chemical or biological properties of wastewater result out of these various uses producing the waste water. If wastewater is discharged untreated into water bodies (such as

[727] Council Directive 86/278/EEC of 12 June 1986 on the protection of the environment, and in particular of the soil, when sewage sludge is used in agriculture (OJ L 181, 4.7.1986, p. 6).

[728] https://ec.europa.eu/environment/water/water-urbanwaste/info/pdf/terms.pdf

inland surface waters, transitional waters, groundwater, coastal waters and marine waters), it deteriorates their ecological and chemical status.

Wastewater treatment is a cornerstone of the Water Framework Directive729 (WFD) and its integrative River Basin Management Plans as well as the WFD's strategies to cut immission from point sources. Wastewater treatment plants work as a gatekeeper and substantially reduce the amount of pollutants from entering water bodies, which would otherwise deteriorate their status. As such, a WWTP treats wastewater produced by others (e.g. households, industries) and leads to a reduction of pollutants emitted to the water bodies. River Basin Management Plans (RBMPs) are tools utilized to identify and prioritize the necessary actions to improve the status of water bodies. These actions involve the confirmation of which wastewater discharges need to be improved in consultation with the relevant stakeholders, including the Competent Environmental Authorities. The prioritizing is made in terms of the positive impact on the water body so this ensures that a substantial contribution is achieved. The wastewater treatment facilities will have to be included in a River Basin Management Plan, or a similar overarching water management plan, in order to achieve substantial contribution.

Without this activity, the goals of the WFD, some of them set as the headline of ambition in the water and marine resources objective, cannot be met.

The objective of the Urban Waste Water Treatment Directive (91/271/EEC) is to protect the environment from the adverse effects of wastewater discharges. The directive demands secondary (biological) wastewater treatment and even more stringent treatment where necessary. The UWWTD will be revised regularly and the WWTP-specific requirements will adapt to the wastewater related principles and ambitions of the EU.

Fulfilling the effluent limits set up by the UWWTD ensures that, especially outside the EU, certain minimum criteria are met, decreasing substantially the local effluent limits in many cases and thus improving the status of water bodies significantly.

The use of an anaerobic sludge stabilization and a subsequent anaerobic digestion in WWTPs with 100,000 PE or more, or of a daily inflow BOD5 load of more than 6,000 kg, ensures that

[729] Water Framework Directive 2000/60/EC

wastewater treatment plants treat the wastewater in an energy and resource-efficient way, compared with the aerobic treatment alternative. This criteria is set as best practice in the document 'JRC Best Environmental Management Practice for the Public Administration Sector. 2019'[730].

The DNSH criteria are the ones considered in the First Delegated Act (Annexes I and II) in relation to the activity '*Construction, extension and operation of waste water collection and treatment*' since the activity is basically the same.

It is recognized that a significant amount of pollution reaches the water bodies through diffuse sources. This activity only covers the municipal wastewater treatment. Diffuse pollution is not considered wastewater and it is generated in general by agricultural activities and should be covered by other activity(ies).

No additional Screening Criteria are proposed for the construction part of the activity since the substantial contribution is achieved by the operation of the wastewater treatment facilities. However, the operation cannot be achieved without the construction of the facilities. It is also understood that the DNSH criteria described above include all the necessary mitigation measures for the possible impacts during the construction phase.

12.2 Phosphorus recovery from waste water

Description of the activity

The activity covers the construction and operation of the necessary facilities for recovering phosphorus from aqueous phase in wastewater treatment plants (WWTP) and from ashes after mono-incineration of sewage sludge.

The activity covers the phosphorus recovery but does not include the use of the recovered material.

[730]Best Environmental Management Practice for the Public Administration Sector | EU Science Hub. https://ec.europa.eu/jrc/en/publication/best-environmental-management-practice-public-administration-sector

It should be noted, that this activity only includes the facilities and processes that make Phosphorus recovery possible, not the previous steps (e.g. Wastewater treatment or incineration facilities).

The economic activities in this category could be associated with several NACE codes, in particular E37.00 and F42.99 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006

Substantial contribution to transition to a circular economy

- For the processes integrated at the WWTP (mainly Struvite– magnesium ammonium phosphate, $NH_4MgPO_4 \cdot 6H_2O$), P recovery processes will recover at least **10%** of the incoming P load. For accounting this threshold, only the harvested material (such as struvite) will be counted.
- For down-stream recovery; (i) after sewage sludge mono-incineration with chemical P recovery or (ii) after sewage sludge mono-incineration with thermal P recovery the process will recover at least **80%** of the incoming P load.

In both cases, the P actually extracted out of the system will be a material with a real market demand ensuring its reasonable use (compliance with the Regulation (EC) No. 2003/2003 of the European Parliament and of the Council relating to fertilizers).

Do no significant harm ('DNSH')

(1) Climate change mitigation	N/A.
(2) Climate change adaptation	DNSH as set out in Appending A of Annex I to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.
(3) Sustainable use and protection for	Environmental degradation risks related to preserving water quality and avoiding water stress are identified and addressed with the aim of

water and marine resources	achieving good water status and good ecological potential as defined in Article 2, points (22) and (23), of Regulation (EU) 2020/852, in accordance with Directive 2000/60/EC[731] and a water use and protection management plan, developed thereunder for the potentially affected water body or bodies, in consultation with relevant stakeholders. Where an Environmental Impact Assessment is carried out in accordance with Directive 2011/92/EU of the European Parliament and of the Council[732], and includes an assessment of the impact on water in accordance with Directive 2000/60/EC, no additional assessment of impact on water is required, provided the risks identified have been addressed.
(5) Pollution prevention and control	Emissions of the Phosphorus recovery are within or lower than the emission levels associated with the best available techniques (BAT-AEL) ranges set out in the latest relevant best available techniques (BAT) conclusions, including: (a) the Best Available Techniques Reference Document (BREF) for the manufacture of Large Volume Inorganic Chemicals - Ammonia, Acids and Fertilisers[733]; (b) the best available techniques (BAT) conclusions for common wastewater and waste gas treatment/management systems in the chemical sector[734]. No significant cross-media effects occur.

[731] For activities in third countries, in accordance with applicable national law or international standards which pursue equivalent objectives of good water status and good ecological potential, through equivalent procedural and substantive rules, i.e. a water use and protection management plan developed in consultation with relevant stakeholders which ensures that 1) the impact of the activities on the identified status or ecological potential of potentially affected water body or bodies is assessed and 2) deterioration or prevention of good status/ecological potential is avoided or, where this is not possible, 3) justified by the lack of better environmental alternatives which are not disproportionately costly/technically unfeasible, and all practicable steps are taken to mitigate the adverse impact on the status of the body of water.

[732] Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment (OJ L 26, 28.1.2012, p. 1).

[733] Best Available Techniques (BAT) Reference Document for the manufacture of Large Volume Inorganic Chemicals - Ammonia, Acids and Fertilisers (version of [adoption date]: https://eippcb.jrc.ec.europa.eu/sites/default/files/2019-11/lvic_aaf.pdf).

[734] Implementing Decision (EU) 2016/902.

(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appending D of Annex I to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.

Rationale

Wastewater contains several valuable materials such as non-fossil carbon, nitrogen, metals, and phosphorus.

Phosphorus is a pivotal nutrient for food production. However, besides Finland, there are no existing mineral phosphate resources in Europe. Thus, 84 % of the European phosphate rock demand is imported (Communication (COM(2020) 474 final)). Because of the limited availability of this scarce resource, and the fact that Phosphorus is an essential element for life and a key nutrient for agriculture, the EU included both phosphate rock and phosphorus (P4)on the list of critical raw materials (European Commission, 2014, 2017 and 2020).

Via human consumption, and after the treatment of wastewater, Phosphorus ends up in sewage sludge. Out of the total amount of Phosphorus, 10 % ends up in the primary sludge and 80 % in the secondary sludge, while usually only 10 % is discharged with the effluent. Today, the European Union produces about 10 million tonnes of dry solids sewage sludge waste each year (Huygens et al., 2017).

Besides direct application of sewage sludge, the two principal routes for P recovery and recycling from the wastewater stream as a nutrient (Kabbe, 2013) are:

- Phosphorus recovery from aqueous phase
- Phosphorus recovery from solid phase / ashes

Phosphorus recovery from aqueous phase and ashes seem to be proper alternatives for nutrient recovery to provide products to be reused in the nutrient cycle. The importance of this reuse can be quantified – only in Germany **“up to 40 %” of the annual phosphorus** demand

could be provided by phosphorus recovery using sewage sludge[735]**".** Therefore, the activity Phosphorus recovery is deemed to produce a substantial contribution to the Circular Economy objective (if the technical screening criteria are met).

Justification of the technical screening criteria

Currently, what is state-of-the-art in terms of technology is driven by the German legislation published in 2017[736]. In this law, WWTPs of a certain size will be required to recover a minimum amount of the incoming Phosphorus load. The requirement depends on the route: In case that the recovery is undertaken from the solid phase/ashes, the P-recovery threshold is 80 %. The transition period for the application of the legislation (15 years) shows the correct level of ambition.

In relation to the aqueous phase, the current technology for P-recovery is less efficient (in terms of percentage of recovery) but this route can also increase the down-stream recovery. A minimum threshold of 10% is set for achieving SC considering that according to the study "P-REX. *Sustainable sewage sludge management fostering phosphorus recovery and energy efficiency*[737]" these facilities can recover 4-18% of total P in sludge with a relatively low effort in energy and chemicals so the chosen threshold is compatible with the DNSH criteria for mitigation. When considering this threshold, only the extracted (harvested) struvite shall be accounted, not the one being left in the sludge matrix.

Justification of the Do No Significant Harm

DNSH for 'Climate change mitigation'. It is not considered relevant since Phosphorus recovered from wastewater has a reduced carbon footprint when compared to the abstraction of the material from the natural source. As an example, it can be noted that the production of natural P4 is an energy-intensive process which is strongly dependent on locally sourced electricity. It is estimated that approximately 14 MWh[738] of electricity is required for each ton of

[735] https://www.tab-beim-bundestag.de/de/pdf/publikationen/themenprofile/Themenkurzprofil-039.pdf

[736] Bundesgesetzblatt Jahrgang 2017 Teil I Nr. 65, ausgegeben am 02.10.2017, Seite 3465: Verordnung zur Neuordnung der Klärschlammverwertung vom 27.09.2017

[737] Project supported by the European Commission within the Seventh Framework Programme Grant agreement No. 308645. 2015

[738] Technical proposals for selected new fertilising materials under the Fertilising Products Regulation (Regulation (EU) 2019/1009)

P4 produced. In addition, the use-on-land phase of the recovered material does not significantly affect the overall impacts for global warming due to their low N content, and thus N_2O emissions.

The rest of the DNSH criteria are based on the first delegated act since are compatible. In particular the DNSH to the Objective 'Pollution Prevention and Control', the criteria is the one used for the activities related to the manufacturing chemicals & fertilisers.

No additional Screening Criteria are proposed for the construction part of the activity since the substantial contribution is achieved by the operation of the Phosphorus recovery facilities. However, the operation cannot be achieved without the construction of the facilities. It is also understood that the DNSH criteria described above include all the necessary mitigation measures for the possible impacts during the construction phase.

12.3 Production of alternative water resources

Description of the activity

The activity "*Production of alternative water resources*" includes the construction, extension and operation of:

- Facilities for producing reclaimed water
- Facilities for harvesting rain and stormwater
- Facilities for collection and treatment of grey water

These systems can be used for aquifer recharge, irrigation, industrial reuse, and recreation.

It should be noted, that this activity only includes the facilities and processes that make it possible for the water to be reused, not the previous steps (e.g. primary and secondary) in the wastewater treatment plant or the subsequent steps necessary for the final reuse of these alternative water resources (e.g. irrigation systems).

The economic activities in this category could be associated with several NACE codes, in particular E37.00 and F42.9 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006

Substantial contribution to transition to a circular economy

1. Production of reclaimed water:

- The reclaimed water must be suitable for reuse (e.g. it must satisfy EU legal provisions such as Regulation EU 2020/741 on minimum requirements for water reuse if used in agriculture)
- The reclaimed water reuse must be included in a water management plan and/or drought management plan at river basin scale, validated by the relevant Competent Authority in relation to Water Management.

2. Facilities for harvesting rain and stormwater:

- The resource (rain/stormwater) will be segregated at source.
- The water must be suitable for reuse after proper treatment depending on the level of contamination and ulterior reuse
- The facility must be included in an instrument of urban planning / permitting (e.g. Master Plan, municipal planning etc.).

3. Facilities for collection and treatment of grey waters:

- The resource (grey water) will be segregated at source.
- The water must be suitable for reuse after proper treatment depending on the level of contamination and ulterior reuse
- The performance must be attested by a building certification or be available in the technical design documents.

Do no significant harm (‘DNSH’)

(1) Climate change mitigation	For the production of reclaimed water, an assessment of the direct GHG emissions from the reuse treatment, has been performed[739]. The results are disclosed to investors and clients on demand.
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.
(3) Sustainable use and protection of water and marine resources	Environmental degradation risks related to preserving water quality and avoiding water stress are identified and addressed with the aim of achieving good water status and good ecological potential as defined in Article 2, points (22) and (23), of Regulation (EU) 2020/852, in accordance with Directive 2000/60/EC of the European Parliament and of the Council[740] and a water use and protection management plan, developed thereunder for the potentially affected water body or bodies, in consultation with relevant stakeholders. Where an Environmental Impact Assessment is carried out in accordance with Directive 2011/92/EU of the European Parliament and of the Council[741] and includes an assessment of the impact on water in accordance with Directive 2000/60/EC, no additional assessment of

[739] For example, following IPCC guidelines for national GHG inventories for waste water treatment (version of [adoption date]: https://www.ipccnggip.iges.or.jp/public/2019rf/pdf/5_Volume5/19R_V5_6_Ch06_Wastewater.pdf)

[740] Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy (OJ L 327, 22.12.2000, p. 1). For activities in third countries, in accordance with applicable national law or international standards which pursue equivalent objectives of good water status and good ecological potential, through equivalent procedural and substantive rules, i.e. a water use and protection management plan developed in consultation with relevant stakeholders which ensures that 1) the impact of the activities on the identified status or ecological potential of potentially affected water body or bodies is assessed and 2) deterioration or prevention of good status/ecological potential is avoided or, where this is not possible, 3) justified by the lack of better environmental alternatives which are not disproportionately costly/technically unfeasible, and all practicable steps are taken to mitigate the adverse impact on the status of the body of water

[741] Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment (OJ L 26, 28.1.2012, p. 1).

	impact on water is required, provided the risks identified have been addressed. For the production of reclaimed water for reuse in agricultural irrigation, the required risk management actions needed to avoid adverse environmental impacts have been defined and implemented (as set out in Annex II of Regulation (EU) 2020/741 of the European Parliament and of the Council of 25 May 2020 on minimum requirements for water reuse -OJ L 177, 5.6.2020, p. 32).
(5) Pollution prevention and control	For the uses prescribed in the EU Regulation (EU) 2020/741, the regulation must be fulfilled. Aquifer recharge and Infiltration of surface runoff waters shall comply with the Ground Water Directive (2006/118/EC).
(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appending D of Annex I to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.

Rationale

With global resource demand growing quickly, there is increasing concern about looming shortages of **critical raw materials** including water[742]**.**

Efficient reuse of treated wastewater and other alternative water resources (such as stormwater and grey water) retains and enhances the value of a critical raw material, such as water.

[742] A Blueprint to Safeguard Europe's Water Resources 2012

The types of Alternative Water Resources that achieve substantial contribution to the Objective Circular Economy are defined as follows:

Production of Reclaimed Water: 'Reclaimed Water' means urban waste water that has been treated in compliance with the requirements set out in Directive 91/271/EEC and which results from further treatment in a reclamation plant; after this treatment, this water can be reused for irrigation (including non-agricultural irrigation e.g. parks); non-potable urban uses, such as street cleaning, toilet flushing in public buildings, public fountains, industrial uses (e.g. cooling) and groundwater recharge. The production of this reclaimed water provides:

- an alternative source, thus enhancing the availability of water and the stability of the water supply; and
- nutrients for irrigation that can reduce the need for artificial fertilisers.

Stormwater harvesting: This is the process of collecting, diverting and storing rainwater from an area (usually roofs or another surface catchment area) for direct or future use. This is a technology that can be used to supply water to agriculture, households and industry, as well as for recharging the aquifers. The harvesting of runoff is beneficial to waterways as it removes potentially damaging flows and pollutants, and it also provides a local alternative water supply.

Grey water recycling: Grey water is untreated wastewater that has not been contaminated by any toilet discharge. Grey water includes wastewater from bathtubs, showers, bathroom sinks, clothes washing machines and laundry sinks. The reuse of this water (which does not require extensive treatment) has been recognized in the Circular Economy model framework as a possible way of implementing Circular Economy principles in the water and wastewater sector.

The activity is considered a low impact activity.

Production of alternative water resources is by its *nature* contributing to the objective of Transition to a circular economy since (i) it retains and enhances the raw material (water) and (ii) it is not a mandatory activity.

In addition, (i) facilities for the reuse and retention of treated waste and process waters; (ii) facilities for the harvesting and reuse of rain and stormwater and (iii) facilities for the collection,

treatment and reuse of grey waters are recognized as **Best Practices**[743] for reducing eventually the demand of fresh water.

Wastewater reuse is a valid approach in order to manage water scarcity and droughts, so in order for it to be considered a Substantial contribution it must be included and implemented as a part of water management plans and/or drought management plans at river basin scale, validated by the relevant Competent Authority in relation to Water Management.

The facilities for harvesting rainwater must be part of the urban planning/permitting processes ensuring that these activities are having an integrated approach in terms of proper use (land and resource). In the same way, facilities for the collection, treatment and reuse of grey waters will have to be documented in the technical designs and building certificates, so the collection is done in a sustainable way.

The DNSH criteria are based on the current EU legislation depending on the final use of the alternative resource and on the First Delegated Act and its annexes, published on 25.04.2021.

No additional Screening Criteria are proposed for the construction part of the activity since the substantial contribution is achieved by the operation of the facilities. However, the operation cannot be achieved without the construction of the facilities. It is also understood that the DNSH criteria described above include all the necessary mitigation measures for the possible impacts during the construction phase.

12.4 Sustainable urban drainage systems (SUDs)

Description of the activity

The activity "*Sustainable Urban Drainage Systems (SUDS)*" includes the construction, maintenance and operation of the following facilities in urban areas (one or a combination of)[744]:

[743] Best Environmental Management Practice for the Public Administration Sector | EU Science Hub. https://ec.europa.eu/jrc/en/publication/best-environmental-management-practice-public-administration-sector

[744] As defined in the document JRC Publications Repository - Best Environmental Management Practice for the Public Administration Sector (europa.eu)

- Water butts, site layout and management
- Pervious pavements
- Filter drains
- Swales
- Filter strips
- Ponds
- Wetlands
- Soakaways
- Infiltration trenches
- Infiltration basins
- Green roofs
- Bioretention areas
- Stormwater pretreatment devices (Sand filters, silt removal devices)

This activity only includes SUDS at the level of urban environment. Nature-based solutions and flood protection outside urban environment are listed in other activities.

The economic activities in this category could be associated with several NACE codes, in particular E37.00 (sewage) and F42.9 (construction of other civil engineering projects) in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

Substantial contribution to sustainable use and protection of water and marine resources

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The SUDS will fulfil the following criteria:

- The construction and operation of SUDs have to be integrated in the urban drainage and wastewater treatment system. This will be proven by means of Flood Management Plan, Urban Planning Tools, such as a Strategic Urban Planning, Land-Use planning, Master Plan, Urban Revitalization Plan and/ or building approval.
- One of the following impact indicators will be declared and calculated in the design of the SUDS:
    - The percentage of a defined area, e.g. a residential or commercial area, where rain water is not directly drained but retained within the area site.

The estimated annual percentage of rain water that is retained in a defined area.

Do no significant harm (‘DNSH’)

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(1) Climate change mitigation	N/A
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.
(4) Transition to a circular economy	N/A
(5) Pollution prevention and control	SUDS must comply with the Groundwater Directive 2006/118/EC and the Water Framework Directive 2000/60/EC, Article 4 to guarantee good chemical status of groundwater and surface water. Depending on the origin of the received waters and therefore the different pollutant load (e.g. of rainwater, rainwater run-off from roofs, rainwater run-off from motorways, stormwater), SUDS treat these waters before discharging/infiltrating the water into other environmental media. The discharge/infiltration may require treatment in accordance to the quality standards of the receiving waters, the removal of TSS, heavy metals, total P, total N, and other substances.
(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appending D of Annex I to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852. SUDS will comply also with the Invasive Alien Species Regulation (Regulation (EU) No 1143/2014) and the respective national environmental law.

Rationale

Rationale for the Substantial Contribution Criteria

SUDS are a collection of practices (see description of the activity) that can play a pivotal role in urban water management by, for example, reducing rainfall-runoff and corresponding combined sewer overflows, increasing rainwater infiltration and thus improving the water balance or providing valuable habitats and therefore supporting biodiversity. The use of SUDS helps to improve both the water quality and the urban water quantity. SUDS are included in the JRC BEMP (*Table 11-15: Techniques to be considered as best environmental management practice for water drainage systems, based on (Sieker, 2004; City of Hamburg, 2006; Woods-Ballard et al., 2007*).

Due to the different scales and induced effects of SUDS (e.g. one green-roof vs. large retention basins), it is mandatory that SUDS are integrated into local planning processes (e.g. wastewater treatment system design, urban planning). These planning processes also determine the criteria SUDS have to fulfil: for example, retaining the rainwater up to an event with an annuity (5, 10, or 15 years). These targets lead to technical SUDS criteria that largely depend on common soil (e.g. hydraulic coefficient, contaminated soils) and water parameters (e.g. rain intensity, rain duration). The technical requirements for SUDS are therefore usually site specific, so is the combination of SUDS to fulfil the set criteria (e.g. green roofs and infiltration ditches).

Depending on the origin of the received waters and therefore the different pollutant load (e.g. of rainwater, rainwater run-off from roofs, rainwater run-off from motorways, stormwater), SUDS can treat these waters through mechanic and biological processes before discharging/infiltrating the treated water into other environmental media.

Several studies assessed the substantial positive impacts of SUDS on urban water management: in Valencia, several elements of SUDS were implemented because the existing urban wastewater system often did not adequately intercept rainwater-runoff, leading to flooding and resulting in the discharge of combined sewer overflows. These were reduced by SUDS and water quality improved (Nature-Based Solution for Climate Change Adaption in Urban Areas, 2017). A study by Allen et al. (2001) shows that bioretention systems can remove up to 90% of heavy metals contained in urban stormwater, which improves the quality of the water resources. In Portland, it was calculated that green alleys or streets, rain barrels, and tree planting in urban areas is 3-6 times more efficient in managing stormwater per $1,000 invested than conventional grey infrastructure (Forster et al., 2011).

SUDS are a relatively new way of managing urban water. Therefore, SUDS are not specifically addressed or fully integrated in existing legislation. However, SUDS do contribute to the following EU environmental legislation:

- The Water Framework Directive (2000/60/EC) has the purpose to protect the water bodies from deterioration by (among others) ensuring the progressive reduction of discharges, emissions and losses of priority substances and the cessation or phasing-out of discharges, emissions and losses of the priority hazardous substances.
- The Groundwater Directive (2006/118/EC) has the purpose to assure the good chemical quality of groundwater.
- The Floods Directive (2007/60/EC) has the purpose to reduce and manage the risks that floods pose to human health, the environment, cultural heritage and economic activities. The Floods Directive covers river floods, flash floods, urban floods, sewer floods and coastal floods.

These directives require monitoring that will also apply to the operation of SUDS.

Rationale for the DNSH criteria

- DNSH Mitigation: SUDS are not energy intensive (sometimes even energy neutral), so no risk of DNSH is identified.
- DNSH Adaptation: The criteria rely on the ones identified in the first delegated act..
- DNSH Circular Economy: The activity is positive for objective circular economy, as by nature, SUDS are rebuilding natural capital, through circular design, by reducing waste and pollution, and regenerating natural systems.
- DNSH Pollution Prevention: Depending on the origin of the received waters and therefore the different pollutant load (e.g. of rainwater, rainwater run-off from roofs, rainwater run-off from motorways, stormwater), SUDS can treat these waters before discharging/infiltrating the water into other environmental media.
- DNSH to Biodiversity: The criteria rely on the ones identified in the first delegated act. In addition, the criteria includes a specific mention to the local legislation and to the

Invasive Alien Species Regulation in order to avoid this issue in case that nature based solutions are implemented.

13. Waste management

13.1 Collection and transport of non-hazardous and hazardous waste

Description of the activity

Separate collection and transport of non-hazardous and hazardous waste in single or comingled fractions aimed at preparing for reuse or recycling.

The activity is classified under NACE code E38.11 and 38.12 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

Substantial contribution to transition to circular economy

1. All separately collected and transported waste that is segregated at source is intended for preparation for reuse or recycling operations;

2. Source segregated waste consisting of (i) paper and cardboard, (ii) textiles, (iii) biowaste, (iv) wood, (v) glass and (vi) WEEE is collected separately (i.e., in single fractions) and not commingled with other waste streams;

3. In the case of source segregated waste other than the fractions mentioned in par. 2, collection in co-mingled fractions takes place only where it meets one of the conditions laid down in EU Directive 2008/98/EC, Article 10, paragraph 3, indents (a), (b) or (c);

4. For municipal waste streams, the activity:

- carries out separate waste collection within publicly organized waste management systems where waste producers are charged based on a pay-as-you-throw (PAYT) mechanism, at least for the residual waste stream

OR

- carries out separate waste collection outside of publicly organized waste management systems that apply deposit and refund systems or other types of economic instruments that directly incentivize waste segregation at source

5. The activity continuously monitors and assesses the quantity and quality of wastes collected based on predefined Key Performance Indicators (KPIs) with the aim of

- fulfilling reporting obligations vis-a-vis relevant stakeholders (e.g., public authorities, EPR schemes),

AND

- periodically communicating relevant information to waste producers and the public in general, in cooperation with relevant stakeholders (e.g., public authorities, EPR schemes)

AND

- identifying needs for and undertaking corrective action where the KPIs deviate from applicable targets or benchmarks, in cooperation with relevant stakeholders (e.g., public authorities, EPR schemes, value chain partners.

Do no significant harm ('DNSH')

(1) Climate change mitigation	N/A
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.
(3) Sustainable use and protection of water and marine resources	N/A
(5) Pollution prevention and control	- Hazardous waste is collected separately from non-hazardous waste to prevent cross-contamination;

	- Proper collection and handling prevent leakage of hazardous waste during collection, transport and delivery to the treatment facility permitted to treat hazardous waste; - Hazardous waste is packaged and labelled in accordance with the international and Community standards in force in the course of collection, transport and temporary storage. - The operator collecting hazardous waste complies with record-keeping obligations including the quantity, nature, origin, destination, frequency of collection, mode of transport and treatment method foreseen set by applicable legislation. For waste electrical and electronic equipment (WEEE): • The main categories of end-of-life Electrical and Electronic Equipment (EEE) set by Annex III of Directive 2012/19/EU are collected separately; • The collection and transport preserve the integrity of WEEE and prevents the leakage of substances of very high concerns such as ozone-depleting substances, fluorinated greenhouse gases or mercury contained in fluorescent lamps; A management system is set up by the collection and logistics operator to manage environmental, health and safety risks.
(6) Protection and restoration of biodiversity and ecosystems	N/A

Rationale

The collection and transport of non-hazardous and hazardous waste is a fundamental phase of the waste management.

Separate collection is a pre-condition for high-quality recycling and preparation for re-use as well as pollution and prevention control by:

- Avoiding littering and illegal waste tipping
- Preventing cross-contamination at source which would compromise the quality of material recovery.

For Municipal Solid Waste, the most common waste collection is via mixed residual waste (by weight, kg/cap). There is still substantial room to support separate collection. Only for dry recyclables (glass, paper/cardboard), is source segregated the most common collection type. This is most shown in the ACR+ study (2017, executive summary) on a comparison of municipal waste management across EU cities.

The collection of waste can be carried out in various forms including door to door, with road containers or in collection centers. Efficient waste collection requires to take into account:

- Local characteristics including population density (highly vs. low-density areas);
- Waste properties in order to preserve material recovery and avoid cross-contamination with other waste fractions.

The main environmental hotspots of waste collection relate to cross-contamination of different waste types, unless they are collected separately.

Separate collection of waste is essential to support the recycling of both non-hazardous and hazardous waste, prevent cross-contamination at source as well as the treatment of hazardous which cannot be materially recovered. It contributes to reduce the pressure on the environment by enabling material value recovery.

Comingled collection is the exception to separate collection and remains permitted by the Waste Framework Directive (WFD) under strict conditions set by 10(3) of the WFD set by 10(3). Yet, in order to ensure that investment made in waste collection will only benefit collection systems which prevent cross-contamination the technical screening criteria further narrow down the conditions under comingled condition can be considered to substantially contribute to the circular economy by deleting the last condition referring of article 10(3) of the WFD referring to economic considerations and excluding certain waste fractions which are more sensitive to cross-contamination.

13.2 Separate collection and transport of hazardous waste

Description of the activity

The activity “Separate collection of hazardous waste” is classified under NACE code 38.12 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

The activity is an enabling activity in accordance with Article 13(1), point (l), of Regulation (EU) 2020/852 where it complies with the technical screening criteria set out in this Section.

Substantial contribution to pollution prevention and control

1. Hazardous waste* is source segregated from non-hazardous waste to be separately collected and transported. Separate collection and transport of hazardous waste include (but is not limited to) the following streams**:

- Hazardous waste fractions produced by households
- Waste oils
- Batteries
- Non-depolluted WEEE
- Non-depolluted end-of-life vehicle
- Medical waste

2. Proper collection and handling to prevent leakage of hazardous waste during collection, transport and delivery to the treatment facility which is permitted to treat hazardous waste.

3. In the course of collection and transport, hazardous waste is packaged and labelled in accordance with the international and Community standards in force.

4. The operator collecting hazardous waste complies with record-keeping obligations including the quantity, nature, origin, destination, frequency of collection, mode of transport and treatment method foreseen set by applicable legislation.

5. For waste electrical and electronic equipment (WEEE):

- The main categories of WEEE set by Annex III of Directive 2012/19/EU are collected separately;

- The collection and transport preserve the integrity of WEEE and prevents the leakage of substances of very high concerns such as ozone-depleting substances, fluorinated greenhouse gases or mercury contained in fluorescent lamps;
- A management system is set up by the collection and logistics operator to manage environmental, health and safety risks.

Compliance with normative requirements for collection and logistics set by CLC/EN 50625-1: *Collection, logistics & Treatment requirements for WEEE - Part 1: General treatment requirements* and CLC/TS 50625-4*: Collection, logistics & treatment requirements for WEEE -- Part 4: Specification for the collection and logistics associated with WEEE* or with regulatory requirements that are equivalent to those set in CLC/EN 50625-1 and CLC/TS 50625-4 is a proof of compliance with the requirement that the collection and transport preserve the integrity of WEEE and batteries and prevents the leakage of hazardous substances.

6. The activity delivers the waste to economic activities which are substantially contributing to either the transition to a circular economy or pollution and prevention control objectives.

*Note: A comprehensive classification of hazardous waste is found in the European List of Waste (2000/532/EC).

**Note: This list is illustrative and thus non-exhaustive.

Note: Hazardous waste separately collected for further material recovery purposes, such as batteries, waste oils, solvents, etc. contribute to both the circular economy and PPC environmental objectives.

Do no significant harm ('DNSH')

(1) Climate change mitigation	N/A
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.

(3) Sustainable use and protection of water and marine resources	N/A
(4) Transition to circular economy	Separately collected waste is not mixed in waste storage and transfer facilities with other waste or materials with different properties.
(6) Protection and restoration of biodiversity and ecosystems	N/A

Rationale

1. The Technical Screening Criteria anticipates future targets by requiring for instance separate collection of hazardous waste for household by 2025.

2. Despite separate collection obligations set by EU legislation, the uptake of separate collection is lagging behind. Even for longstanding separate collection obligation, for instance for WEEE, reports have found that significant volumes escape proper collection and then treatment. For instance, the CWIT project showed that in Europe *just 35% (3.3 million tonnes of 9.5 million tonnes) of used (but still functioning) and waste electronics and electrical equipment discarded by companies and consumers in 2012 wound up in official collection and recycling systems*.

Hazardous waste collection is considered a complex task that requires significant investments in terms of infrastructure and maintenance/improvement of hazardous waste collection schemes and requires numerous participants in the private and public sector[1]. Hazardous waste can take the form of solids, liquids, sludges, or contained gases and are classified on the basis of their properties (biological, chemical and physical)[2].

The very first step of proper hazardous waste management is the collection of waste classified as hazardous (also referred to as hazardous and special waste by the industry). Separate collection plays an essential role in preserving the physical integrity of hazardous waste in

various forms and preventing the leakage of hazardous substances. Besides substantially contributing to pollution and prevention control, proper collection of hazardous waste can help to close the loop of materials and hence contribute to circular economy.

To allow successful hazardous waste collection, some crucial activities have to take place before. These include:

- proper storage
- labelling of the hazardous waste
- hazardous waste should not be mixed

The substantial contribution of separate collection of hazardous waste is to:

- ensure that hazardous waste is collected separately from non-hazardous waste;
- proper collection and handling prevent leakage of hazardous waste during collection, transport and delivery to the treatment facility permitted to treat hazardous waste, including through the implementation of standardised organisational measures for specific streams such as e-waste;

so as to reduce the pressures on the environment by preventing or reducing direct emissions of pollutants.

13.3 Treatment of hazardous waste as a means for pollution prevention and control

Description of the activity

The activity is classified under NACE code E38.22 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006

Sub-activities: construction, revamping, upgrade, and operation of dedicated facilities for the treatment of hazardous waste, including the incineration of hazardous waste.

The following sub-activities are excluded from the scope:

1) Disposal operations of hazardous waste e.g., landfilling or permanent storage.

2) The construction, revamping, upgrade and operation of non-dedicated facilities incinerating hazardous waste i.e., non-dedicated hazardous waste incinerators that may still be permitted to accept and treat hazardous waste.
3) The treatment and disposal of toxic live or dead animals and other contaminated waste.
4) The disposal of used goods such as refrigerators.
5) The treatment, disposal of radioactive nuclear waste.

Substantial contribution to pollution prevention and control

Compliance (as a minimum) with the requirements defined in the BAT conclusions of the WT and WI BREFs, aiming to optimise the effectiveness and environmental performance of treatment processes for the safe destruction of the hazardous substances present in the waste (as per the implementation of BAT 8 of WI BREF, in case of thermal treatment). Facilities that have been granted a derogation as per the procedure outlined in IED article 15(4) are not considered as fulfilling the Technical Screening Criteria.

Additional criteria for types of treatment or treatment steps that may have a higher environmental impact are outlined below:

1) **Concerning all waste treatment processes (Technical Screening Criteria complementary to BAT 2 of WT BREF):**

Pre-acceptance procedures:

In the case of hazardous waste, at least the following information must be gathered:

- (Expected) date of arrival at the waste treatment plant.
- The contact details of the waste producer and the sector which the waste originates from. The nature of process producing the waste, incl. the variability of the process.
- The estimated quantity expected to be delivered to the operator per delivery and per year.
- Description of the waste, incl.: composition, hazardous properties of the waste, waste code, the appropriate / suitable treatment route.

Acceptance procedures:

In the case of hazardous waste, the following elements are in place:

- A reception facility equipped with a laboratory to analyse samples on site and documented analytical standard operating procedures,
- Documented sampling procedure consistent with relevant standards (e.g., EN 14899)
- Documented analysis of the relevant physico-chemical parameters for the treatment
- A dedicated quarantine waste storage area, as well as written procedures to manage non-accepted waste.

Furthermore, the personnel having to deal with the (pre-) acceptance procedures need to be able due to his profession and/or experience to deal with all necessary questions relevant for the treatment of the wastes in the waste treatment facility. The procedures are intended to (pre-) accepting wastes at the waste treatment plant only if an appropriate / suitable treatment (route) is available and the disposal/recovery route for the output of the treatment is determined.

As far as 'blending or mixing activities' are concerned (as per IED Annex I, section 5.1(c)), it is important to ensure that the operator is not using dilution (as a substitute for adequate treatment) to lower the concentration of one (or more) hazardous substances present in the waste.

2) Applicable to the physico-chemical treatment of solid and/or pasty waste (complementary to BAT 40 and 41 of WT BREF):

Any physico-chemical treatment of solid and/or pasty waste for the purpose of treating waste prior to final disposal (e.g., in hazardous waste landfills) should be designed in order to:

- limit at 6% TOC maximum in each single input waste to the landfill
- limit at 1000 mg/kg dry matter DOC content of the output waste after a leaching test with L/S = 10 l/kg based on EU Standard EN 12457-2

3) **Applicable to the physico-chemical treatment of waste with calorific value (complementary to BAT 45 and section 4.5 of WT BREF):**

In order to avoid dilution and dispersion of hazardous substances and finally to avoid any high loads released into the air due to inappropriate final treatment of waste with calorific value, any physico-chemical treatment installation of waste with calorific value prior to final thermal treatments (incineration or co-incineration) are designed in order to limit the content of hazardous substances and other criteria for each single input waste entering the treatment installation at the same levels as the levels for the acceptance at the entrance of the final thermal treatment installations.

4) **Applicable to:**

a) the treatment of water-based liquid waste
b) other waste treatment processes, where there is an indirect wastewater discharge[745] (complementary to BAT 19 and 20 of WT BREF):

The goal of the operator shall primarily be to prevent emissions to soil and water, through the implementation of techniques BAT 19 a (roofing) and BAT 19 c (impermeable surface).

Furthermore, abatement techniques for metals should be primarily optimized for the removal of mercury and cadmium: chemical precipitation, flocculation, sedimentation, combined with specific precipitation of mercury using sulphurous precipitants in a separate step, or alternatively using selective ion exchange or membrane filtration or application of activated carbon.

In case of indirect discharge of the waste water, the emission limit values of heavy metals and other persistent pollutants monitored in BAT 20 at the point of discharge of the installation are identical as if the waste water would have been discharge directly in water bodies. This will provide that there is no higher level of pollution of the environment due to inadequate treatment in a downstream (biological) waste water treatment plant. The operator cannot make use of footnote 2 of table 6.2 in this case.

[745] indirect discharge: discharge not directly to the environment, but to a sewer or to an off-site waste water treatment plant

5) **Applicable to the treatment of water-based liquid waste (complementary to BAT 52 and BAT 53 of WT BREF):**

The biological treatability of the wastewater resulting from the treatment of the water-based liquid waste in a biological waste water treatment plant shall be judged based on the following criterion:

DOC[746] elimination of >70% in 7 days (>80% when adapted inoculum is used) in accordance with EN ISO 9888 (Zahn Wellens).

6) **Applicable to the treatment of POP-containing waste (complementary to BAT 51 of WT BREF, and to BAT 8 of WI BREF):**

All waste containing POP substances listed in annex IV to Regulation 2019/1021 on POP are controlled and traced as hazardous waste in accordance with Article 17 of Directive 2008/98/EC. For POP waste that is also classified as hazardous waste, the specific requirements of article 7.4, 17, 18 and 19 of the Waste Framework Directive apply as well as requirements of chapter I of the Waste Shipment Regulation in case of transboundary movement,

The tracking system in place in the installations based on the above best practices allows the monitoring of:

a. the effective separation of each part of a product or waste such as waste equipment, containing or contaminated with POP above the levels defined in annex IV to the POP Regulation, and subsequently
b. the effective destruction or irreversible transformation of the POP waste in compliance with articles 7(2) – 7(4) and Annex V to the POP regulation.

7) **Applicable to the treatment of mercury-containing waste (complementary to BAT 32 and 31 of WI BREF):**

All installations likely to treat waste consisting of, containing or contaminated with mercury or mercury compounds (as defined in article 11 of the Minamata Convention), implement, as a best practice, the traceability system described in article 14 to the Regulation

[746] DOC: Dissolved Organic Carbon

2017/852 on mercury or a similar one. Based on this tracking system, the installations treating mercury-containing waste (meaning waste consisting, containing or contaminated with mercury or mercury compounds) monitor the effective safe fate of mercury and mercury compounds in appropriate final destination.

8) Applicable to the (non-combustion) treatment of healthcare waste:

The installation shall implement the best practices defined in the safe management of health care waste from WHO:

https://www.euro.who.int/__data/assets/pdf_file/0012/268779/Safe-management-of-wastes-from-health-care-activities-Eng.pdf

In addition, and in order to ensure that there is no risk of pollution of the environment and no risk for health, the following best practices can be taken into consideration. A non-combustion healthcare waste installation has specific acceptance procedure, monitors and can prove that the following types of healthcare waste are not accepted for treatment:

- Cytotoxic waste
- Pharmaceutical waste
- Chemical waste
- Radioactive waste

Finally, the technologies used have to be certified by an acknowledged body.

Do no significant harm ('DNSH')

(1) Climate change mitigation	N/A
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.
(3) Sustainable use and protection of	Relevant techniques for the activity concerned are deployed as described for the protection of water and marine resources, as set out in

water and marine resources	the Best Available Techniques Reference Document (BREF) for Waste Treatment.
(4) Transition to circular economy	N/A
(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appending D of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.

Rationale

Choice of activity: The treatment of hazardous waste is a very important activity, as such wastes pose a greater risk to the environment and human health than non-hazardous ones. Effective treatment is necessary, first of all, for the reduction of the hazardous nature of the waste, and of the amount of waste which has to be finally sent for disposal. As a secondary objective, hazardous waste is treated with the aim of recovering the hazardous substances (such as in the case of regeneration of solvents or acids), or with the aim of recovering the non-hazardous (or decontaminated parts), which would be segregated and potentially further treated into useful secondary materials. These cases have been addressed in a separate template of the ST 10 group, entitled: 'treatment of hazardous waste as a means of recovery' (SC: circular economy objective).

Exclusion of specific sub-activities: the sub-activities outlined above are excluded based on the following rationale:

a) Disposal operations of hazardous waste e.g. landfilling or permanent storage:

The aim is to promote treatment and recovery operations, not disposal. Only treatment prior to disposal can be considered as 'taxonomy-aligned', but not the disposal operation itself.

b) The construction, revamping, upgrade and operation of non-dedicated facilities incinerating hazardous waste i.e. non-dedicated hazardous waste incinerators that may still be permitted to accept and treat hazardous waste:

The incineration of non-hazardous waste has been excluded because of significant harm caused to the CE objective, and the objectives of the first delegated taxonomy act. There should therefore be no indirect inclusion and exemption for non-hazardous waste incinerators that are also permitted to treat an additional fraction of hazardous waste.

c) The treatment and disposal of toxic live or dead animals and other contaminated waste:

Sub-activity was deprioritised due to time constraints. We suggest that it is revisited in the next revision of the TSC.

d) The disposal of used goods such as refrigerators:

See the explanation provided under point (a).

To be noted that the treatment of such goods, has been addressed in a separate template of the ST 10 group, entitled: 'treatment of hazardous waste as a means of recovery' (SC: circular economy objective).

e) The treatment, disposal of radioactive nuclear waste:

Sub-activity was deprioritised due to time constraints. We suggest that it is revisited in the next revision of the TSC.

Level of granularity and choice of approach for the TSC development:

The starting point of reflection was the scope of the EU Industrial Emissions Directive (Annex I) and the scope of the EU BREFs for waste treatment and waste incineration. Due to the many different existing technologies, a combination of horizontal, qualitative TSC and, wherever possible, process-specific, quantitative ones were developed – based on a combination of approaches (5), (6) and (2).

TSC development:

The treatment of hazardous waste is an activity that makes a substantial contribution to the objective of pollution prevention and control (PPC), **provided that** it is performed based on effective techniques, and takes place in appropriate treatment facilities.

To therefore determine whether a given project is indeed making a substantial contribution to the PPC objective, focus should be put on whether: a) the plant is designed, equipped, and operated in a way that would allow the effective treatment of the type of waste in question; and b) the operator implements measures that optimise the performance of treatment processes for the safe destruction of the hazardous substances present in the waste, and measures for the protection of health and the environment e.g. as per the techniques described in the EU BREFs for waste treatment (WT) and waste incineration (WI)[747].

In order for the activity to be taxonomy-aligned, the operator has to comply (as a minimum) with the requirements defined in the BAT conclusions of the WT and WI BREFs. Consequently, all the considered installations must prove that no derogation according to article 15.4 to the IED has been agreed by competent authorities.

Furthermore, the operator should aim for an ambitious implementation of some provisions (referred to as 'Best Available Techniques conclusions' or BAT conclusions) of the EU BREFs, as clearly specified above, in the TSC section. The reason being that the techniques, included in the BREFs, are neither prescriptive nor exhaustive per se, and they can be implemented in a more or less ambitious manner in terms of level of environmental protection achieved. To be noted that the specific BAT conclusions (please refer to the TSC section) are highlighted because of the potential impact of the relevant activities to the environment. It needs to be clear that activities not explicitly mentioned above are not excluded from the scope; the compliance with the requirements defined in the BAT conclusions in these cases is enough for these treatments to be considered as taxonomy-aligned.

Further explanation regarding specific TSC:

- **Additional TSC 1:** This TSC is complementary to WT BREF BAT 2. BAT 2 includes techniques aiming at the improvement of the overall environmental performance of the

[747] The EU BREFs outline the best available techniques that operators of installations may employ in order to optimise their processes, and prevent or reduce their impact to health and the environment

plants, such as the establishment of waste characterisation and (pre-)acceptance procedures, of a waste tracking system and inventory and of an output quality management system.

Techniques 2(a) (pre-acceptance procedures) and 2(b) (acceptance procedures) are of particular importance as unsuitable waste input(s) and/or inefficient input control processes could have a big impact on the overall environmental performance of the installations. A comprehensive (pre-)acceptance procedure is important for the efficient treatment of the waste and the prevention or minimisation of any environmental impact; such techniques aim to both ensure the proper treatment of waste, as well as the suitability of the receiving installation. Since BAT 2 refers to the aim of the techniques rather than the techniques themselves, this gap is filled by additional TSC 1.

As far as 'blending or mixing activities' are concerned, this practice is banned by the EU Waste Framework Directive, but it is still on-going in different member states either of the purpose of re-directing the waste to cheaper subsequent treatment options, or (when the dilution takes place on-site) for compliance with emission standards.

- **Additional TSC 2:** The derogations introduced in the Council Decision 2003/33/EC establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 and Annex II to Directive 1999/31/EC regarding these 2 criteria (total TOC content and DOC content after leaching test) in section 2.4 of the Annex of the Decision are not applicable to installations covered by this fiche. It will ensure that no organic compounds will impact the final sink behaviour on the long term.

- **Additional TSC 3:** As aforementioned, dilution practices are still on-going in different member states either of the purpose of re-directing the waste to cheaper subsequent treatment options, or (when the dilution takes place on-site) for compliance with emission standards. This TSC may contribute in limiting such illegal practices.

- **Additional TSC 4: The sound implementation of BAT 20 is of utmost importance, especially regarding the BAT-AELs for the heavy metals cadmium (Cd), mercury (Hg). Cd and Hg are recognized as Priority Hazardous Substances under the EU Water Framework Directive** which dictates action so that they are eliminated: any pollution through discharge, emission or loss must cease or be phased-out.

  Regarding the inadequacy of downstream waste water treatment plants: such plants may not be fitted to treat toxic heavy metals or other persistent pollutants. It therefore

does not guarantee an equivalent level of protection for many critical pollutants e.g. for toxic heavy metals: the removal efficiency is lower than in the case of a physico-chemical treatment, there is dilution and, often, it is not the polluter who pays.

- **Additional TSC 5:**

  BAT 52 guides companies to choose the optimal treatment route. This provision can be further strengthened by including criteria for bio-eliminability that can be used to decide whether a waste water stream is adequately treatable in a biological WWTP or should be pre-treated first. Such criteria aim to ensure that liquid wastes containing a significant load of organic PBT[748] substances are treated separately in order to minimize the risk posed to receiving water bodies and soil.

- **Additional TSC 6:**

  In addition to BAT 51, as POP substances are of global concern (as recognised by the Stockholm Convention), this TSC, more ambitious than the current legislation, should be fulfilled in the installations likely to handle POP-containing waste.

- **Additional TSC 7:**

  In addition to BAT 32, as mercury is of global concern (as recognised by the Minamata Convention), this TSC, more ambitious than the current legislation, should be fulfilled in the installations likely to handle mercury-containing waste.

13.4 Treatment of hazardous waste as a means for material recovery

Description of the activity

This activity covers the treatment of hazardous waste, as a means for material recovery operations. This includes the construction, upgrade, and operation of such facilities. Hence, in accordance with the statistical classification of economic activities established by

[748] Persistent, Bio-accumulative and Toxic

Regulation (EC) No 1893/2006, the activity is categorised under one, or multiple, of the following NACE codes:

- E38.22 (which includes the operation of facilities for the treatment of hazardous waste);
- E38.32 (which includes the operation of facilities for the recovery of materials); and
- F42.9 (which includes the construction of other civil engineering projects).

This activity covers both in-situ and ex-situ material recovery operations of waste classified as hazardous waste according to the European List of Wastes (ELoW). This includes, but is not limited to, the following streams:

- Solvent reclamation/regeneration;
- Regeneration of acids and bases;
- Recycling/reclamation of inorganic materials other than metals or metal compounds;
- Recovery of components from catalysts;
- Re-refining of oil lubricants and other industrial waste oils (excluding for use as fuel/incineration).

The reuse of substances that do not qualify as waste (e.g., by-products/residues from production activities) according to Article 5 of the Waste Framework Directive is not covered by this activity.

The activities that recover materials from the following waste streams are not included in these technical screening criteria: Batteries, Waste Electrical and Electronic Equipment (WEEE), End-of-Life Vehicles (ELV), inorganic materials from incineration processes (e.g., ashes, slags, dust). Furthermore, the treatment and recovery of nuclear waste is excluded.

Substantial contribution to transition to circular economy

The activity is specifically designed for the material recovery of secondary raw materials (including chemical substances) from source segregated hazardous waste, as its primary aim.

The recovered materials are substituting virgin materials or chemicals in production processes.

AND

The recovered materials fulfil applicable industry specifications, harmonized standards, or end-of-waste criteria.
Do no significant harm ('DNSH')

(1) Climate change mitigation	The activity, on a life-cycle basis, does not increase GHG emissions as compared to the production of the equivalent primary raw material(s) (based on EN ISO 14044:2006, concerning Life cycle assessments).
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.
(3) Sustainable use and protection of water and marine resources	Relevant techniques for the activity concerned are deployed as described for the protection of water and marine resources, as set out in the Best Available Techniques Reference Document (BREF) for Waste Treatment.
(5) Pollution prevention and control	All wastes, substances, and mixtures recovered under such activities comply with the applicable sustainability rules on the placing on the market of hazardous substances, including Regulation (EC) No 1907/2006[749], Regulation (EU) No 2019/1021[750], and Regulation (EC) No 1272/2008[751]. Relevant techniques for the activity concerned are deployed as described for pollution prevention and control, as set out in the Best

[749] Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH). Link here.

[750] Regulation (EU) 2019/1021 of the European Parliament and of the Council of 20 June 2019 on persistent organic pollutants. Link here.

[751] Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures. Link here.

	Available Techniques Reference Document (BREF) for Waste Treatment. This includes the following BAT-AELs: For oil re-refining for lube and other industrial waste oils OR solvent reclamation/regeneration, channelled emissions of TVOC to air from the re-refining of waste oil is set for TVOC of 5-30 mg/Nm^3. This does not apply if the emission load is below 2 kg/h at the emission point as long as no CMR substances are identified in the waste gas stream.
(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appending D of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852

Rationale

The management of hazardous wastes is strictly regulated in the EU. The relevant legal document is the Waste Framework Directive (2008/98/EC as amended), which sets the basic concepts and definitions related to waste management. Hazardous waste means *'waste which displays one or more of the hazardous properties listed in Annex III'* of EU Directive 2008/98/EC (EU Waste Framework Directive or WFD), including explosivity, flammability, acute toxicity and toxicity for reproduction. The classification into hazardous and non-hazardous waste is based on the European List of Waste.

The focus of such hazardous waste management, however, is on pollution prevention and control (labelling, record keeping, monitoring, and control). Only between 35 – 39% of hazardous waste was recovered between 2010 and 2018.[752] Nevertheless, several hazardous waste streams can be material recovered and LCA data shows the broad environmental benefits of these forms of treatment.[753] Therefore, focusing treatment activities

[752] Eurostat "Treatment of waste: by waste category, hazardousness and waste management operations [Env_wastrt]". Link here.

[753] *Used oils*: IFEU (2017) "Ecological and energic assessment of re-refining waste oils to base oils", link here; *Spent solvents*: ESRG (2013) "Carbon Footprints of Recycled Solvents", link here.

on material recovery (preparation for reuse and recycling), should be considered as a substantial contribution to the Circular Economy, as long as such treatment does not cause significant harm to the environment. This ensures material recovery is always favoured, unless the activity would have lower impacts if treated in other non-material recovery methods.

The material recovery of hazardous waste directly contributes to a more circular economy by substituting virgin feedstock with secondary raw materials or reclaimed chemicals into different value chains.

This fiche therefore tries to encapsulate all hazardous waste streams, only excluding waste streams that are more appropriately covered in other fiches, where more specific Technical Screening Criteria can be created. Upgrade and construction activities are further included to ensure the upscaling of hazardous waste material recovery facilities.

Technical Screening Criteria (TSC)

The Technical Screening Criteria are kept simple and to the point. The substantial contribution is via the material recovery of hazardous waste, which would otherwise be disposed of through incineration, landfilling or by other means. This allows clear usability of the Technical Screening Criteria, as well as ensuring a level-playing field is created – i.e., no waste streams or material recovery technologies are discriminated against. The Technical Screening Criteria outlines the activity's "primary aim", to highlight the economic activity should be principally motivated by this type of hazardous waste material recovery, rather than it treating as a side-treatment method whilst engaging in non-substantially contributing activities. This further goes beyond EU legislation which focuses on the safe disposal of hazardous waste, however does not push for the material recovery of such materials.

Do No Significant Harm (DNSH)

Owing to the simplified Technical Screening Criteria, the DNSH criteria are utilised as a backstop to ensure the environmental integrity of the economic activity. For climate change mitigation, the life-cycle assessment is required to ensure the material recovery does not emit more GHG emissions than the production of the equivalent raw material (for which the material recovery intends to substitute). Best practices are outline in the form of the BAT conclusions and BAT-AEL from the Waste treatment BREF, for both pollution prevention & control, and sustainable use and protection for water and marine resources. Additionally, for pollution prevention & control, EU chemical legislation is referenced to ensure hazardous chemicals

recovered meet relevant practices. This ensures policy coherence with the products re-introduced onto the market via material recovery. The criteria for climate change adaptation and protection and restoration of biodiversity and ecosystems are to ensure alignment with the previous Delegated Acts.

13.5 Recovery of bio-waste by anaerobic digestion and/or composting

Description of the activity

Construction and operation of dedicated facilities for the treatment of separately collected bio-waste through anaerobic digestion and/or composting with the resulting production and utilisation of biogas and/or digestate and/or chemicals.

The activity is classified under NACE code E38.21 and NACE code F42.9 (construction of other civil engineering projects) in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

Substantial contribution to transition to circular economy

The feedstock of the activity is source segregated bio-waste from separate collection.

The bio-waste includes also packaging compliant with EN 13432: 2002 and plastics compliant with EN 14995: 2006.

The activity produces compost or digestate complying with the Regulation (EU) 2019/1009, in particular Annex II on the Component Material Categories, referring specifically to (CMC) 3 (Compost) and 5 (Digestate other than fresh crop digestate) or national rules on fertilisers or soil improvers for agricultural use, with equal or stricter requirements compared to those of Regulation 2019/1009.

“Quality assurance of the production process” is guaranteed by using Module D1 foreseen by Regulation (EU) 2019/1009.

Compost and digestate complying the above Regulation (EU) 2019/1009 or equivalent national rules cannot be landfilled.

In case the anaerobic digestion is installed, the produced biogas, that cannot be less than 110 m3 per 1 tonne of bio-waste, is used directly for the generation of electricity or heat, or upgraded to bio-methane for injection in the natural gas grid, or used as vehicle fuel or as feedstock in chemical industry.

Do no significant harm ('DNSH')

(1) Climate change mitigation	*This criterion is not in the scope of this call for feedback.*
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852
(3) Sustainable use and protection of water and marine resources	DNSH as set out in Appending B of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852
(5) Pollution prevention and control	The activity must comply with BAT conclusions for waste treatment (Commission implementing decision 2018/1147), in order to reduce emissions to air and to improve the overall environmental performance as well as to select the waste input and to monitor and/or control the key waste and process parameters. In particular, for anaerobic digestion plants treating over 100 tonnes per day and for composting plants treating over 75 tonnes per day, emissions to air and water are within or lower than the emission levels associated with the best available techniques (BAT-AEL) ranges set for, respectively, anaerobic and aerobic treatment of waste in the latest relevant best available techniques (BAT) conclusions, including the best available techniques (BAT) conclusions for waste treatment.

	The BAT conclusions are the following: BAT 19. In order to optimise water consumption, to reduce the volume of waste water generated and to prevent or, where that is not practicable, to reduce emissions to soil and water, BAT is to use an appropriate combination of the techniques given below. BAT 20. In order to reduce emissions to water, BAT is to treat waste water using an appropriate combination of the techniques given below and associated BAT-AELs for direct discharges to a receiving water body 3.1 General BAT conclusions for the biological treatment of waste: BAT 33. In order to reduce odour emissions and to improve the overall environmental performance, BAT is to select the waste input. BAT 34. In order to reduce channelled emissions to air of dust, organic compounds and odorous compounds, including H2S and NH3 and associated BAT-AELs. BAT 35. In order to reduce the generation of wastewater and to reduce water usage. 3.2 BAT conclusions for the aerobic treatment of waste: BAT 36. In order to reduce emissions to air and to improve the overall environmental performance, BAT is to monitor and/or control the key waste and process parameters. BAT 37. In order to reduce diffuse emissions to air of dust, odour and bioaerosols from open-air treatment steps, BAT is to use one or both of the techniques given below. 3.3 BAT conclusions for the anaerobic treatment of waste: BAT 38. In order to reduce emissions to air and to improve the overall environmental performance, BAT is to monitor and/or control the key waste and process parameters.

	In case of anaerobic digestion, the Nitrogen content (with tolerance level ± 25%) of the digestate used as fertilisers or soil improver is communicated to the buyer or the entity in charge of taking off the digestate.
(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appending D of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852

Rationale

The activity is included because bio-waste is a stream very relevant in quantity in Municipal Waste (20-60% of municipal solid waste is biowaste, the percentage depends on the country) and its treatment contributes to recycle waste by producing compost or digestate which replace virgin raw materials and recover renewable energy or fuels, at the same time avoiding disposal in incineration plants or landfills (according to ECN Status Report 2019, the 4274 composting and anaerobic digestion plants sited in 18 European states, included UK and Norway, in 2016 or 2017 treating 47.5 million tonnes of bio-waste produced 11.7 million tonnes of compost and 4.1 million tonnes of digestate. ECN estimated that by compost and digestate produced, they have been recycled 129 thousand tonnes of Nitrogen, 42 thousand tonnes of phosphate, 3.5 million tonnes organic carbon and 1.8 million tonnes humic substances).

The bio-waste includes also packaging compliant with EN 13432: 2002 (the European standard relating to “Requirements for packaging recoverable through composting and biodegradation”) and plastics compliant with EN 14995 (the European Standard that specifies requirements and procedures to determine the compostability or anaerobic treatability of plastic materials). In case of anaerobic digestion of biowaste containing packaging and plastics compliant respectively with EN 13432 and EN 14995, the digestate need always to be submitted also to a subsequent aerobic treatment (composting).

The activity includes also “Construction and Modernization” of the facilities for bio-waste treatment, because the alternative would be to dispose it in incinerators or landfill, which are not aligned to taxonomy and don’t allow any contribution to circular economy. It must also be considered that WFD set the obligation of separate collection of many waste streams, including bio-waste and thus additional important volumes of bio-waste are expected. So, it will be

requested an increased, well deployed (intended as the best trade-off of the respect of the proximity principle and the need of facilities at industrial scale) and technologically advanced capacity to treat bio-waste. Moreover, landfill disposal of bio-waste besides not contributing to circular economy, is a cause of GHG emissions and production of the leachate, with related risk for groundwater and water resources.

The use of compost and digestate, complying with the Regulation (EU) 2019/1009, in particular Annex II on the Component Material Categories, referring specifically to (CMC) 3 (Compost) and 5 (Digestate other than fresh crop digestate) or national rules on fertilisers or soil improvers for agricultural use, with equal or stricter requirements compared to those of Regulation 2019/1009, contributes to increase soil organic matter and restore carbon-rich ecosystems.

The activity allows to reduce pressure on the environment through circular value recovery, by producing high-quality compost or digestate from bio-waste, which substitute synthetic fertilizers and avoid the environmental impacts associated with their production and the extraction of raw materials.

Already now, according to ECN (European Compost Network) Status Report 2019, the compost and digestate currently produced have been destined to: Agriculture 50%, Horticultural Growing Media 15%, Hobby Gardening 14%, Landscaping 15% and Other 6%.

The bio-waste treatment is necessary to recover material (and when anaerobic digestion is integrated to composting also energy or fuel), but its performance depends mainly on the quality of the input, i.e. the bio-waste from separate collection. So, qualitative approach (practice-based) should be more adequate than quantitative ones.

In general, anaerobic digestion integrated to composting, since it implies also the production of renewable energy or fuels, is a preferable option respect to composting only, but here they are both and together presented, because the choice of the best option depends on local factors, like, for example: a) the volume of bio-waste that is foreseen to treat. Indeed, the amount of the feedstock can be a critical factor to the viability of the investment; b) the characteristics of the feedstock, as bio-waste from gardens and parks are not suited for anaerobic digestion.

The DNSH criteria are assessed in order to the impacts of the bio-waste treatment facility on the environment, taking in consideration to comply mainly with the BAT conclusions on Waste Treatment and the Delegated Acts.

13.6 Remediation of legally non-conforming landfills and abandoned or illegal waste dumps

Description of the activity

The activity falls under the following NACE Codes in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006:

- NACE Code E38.2 (Waste treatment and disposal) covering the operation of landfills for the disposal of waste. By extension, the operation of landfills also includes pollution prevention and control activities after cease of operations and in the after care period.

- NACE Code E39 (Remediation and other waste management activities) covering the remediation of environmental damage caused by improper waste management.

The term 'landfill' is defined as in the EU Landfill Directive as a "waste disposal site for the deposit of the waste onto or into land (i.e. underground)" including both non-hazardous and hazardous waste.

A "legally non-conforming" landfill is a landfill that does not comply with the operational and technical requirements defined in relevant EU or national legislation.

A "waste dump" is a site used for the disposal of waste that is not equipped with pollution abatement systems.

This activity includes:

- the excavation and removal (to external treatment or disposal facilities) or, where this is not possible, the structural stabilization, concentration and encapsulation of wastes on-site to eliminate or significantly reduce further generation and release of pollutants from the landfill body to soils, water and air

- installation and operation of technical systems for the collection and treatment of leachates and landfill gas generated inside the landfill body

- decontamination of soils, surface and groundwater at the place of pollution, either in situ or ex situ, using e.g. mechanical, chemical or biological methods

- on-site installation and operation of technical systems for the monitoring and control of pollutants in surface groundwater during and after implementation and remediation collection and treatment of leachates and landfill gas generated inside the landfill body

In addition, it includes all enabling ancillary activities that are required to prepare, plan, monitor and follow-up the remediation activity itself, for example:

- Procedures for the permanent closure of landfilling operations
- Surveying activities (e.g., geological, hydrological, etc.)
- Sampling of soil, water, sediment, biota or other materials
- Laboratory analysis of samples to identify the nature and concentration of pollutants
- Execution of technical feasibility studies

For the sake of clarity, the following activities are NOT included in the scope of the proposed activity:

- The closure, technical rehabilitation and after care of landfills that are in compliance with the EU Landfill Directive (1999/31/EC as amended) or equivalent national legislation
- Remediation activities undertaken to comply with the EU Directive on environmental liability (2004/35/CE) or equivalent international and national legislation that apply the polluter-pays-principle to the remediation of environmental pollution caused by economic activities

The construction and operation of dedicated facilities for the recovery of materials and fuels from landfilled waste

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Substantial contribution to pollution prevention and control

The activity substantially contributes to pollution prevention and control where all the following criteria are met (cumulatively):

1. The remediation of the landfill is not undertaken as an obligation to comply with the EU Directive on environmental liability (2004/35/CE) or equivalent international and national legislation that apply the polluter-pays-principle to the remediation of environmental pollution caused by economic activities
2. The remediation activity is prepared and conducted in line with best industry practice and including all of the following elements:

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a. The landfill to be remediated has ceased operations and is not taking in further waste

b. Site-specific physical, chemical and/or microbiological data collection and analysis in line with best industry practice and best available techniques to confirm the exact location, type and extension of the landfill and define the sources, types and magnitude of pollution originating from it as well as the risks to human health and the environment. The results of such investigations are used to evaluate the remedial options.

c. The remedial options are analysed based on Annex II of EU Directive 2004/35/CE and EU Directive 1999/31/EC (as amended), in particular its Annex I and III (or equivalent) and defined in a landfill remediation project, including monitoring requirements

d. The landfill remediation project is approved by the competent authority and consulted with local stakeholders

e. Any hazardous waste extracted or otherwise produced by the remediation activity is subject to appropriate collection, transports, treatment, recovery and/or disposal by an authorized operator, in accordance with legal requirements;

f. Soil and groundwater remediation methods based exclusively on reducing pollutant concentrations through dilution or watering down are not considered acceptable.

g. A control and monitoring plan is implemented as part of the landfill remediation project to assess and verify the desired outcome of the proposed remediation measures for at least [10] years

3. As a result of the landfill remediation project:

a. The generation of pollutants and other nuisances from the remediated landfill are significantly reduced so that they no longer pose any significant risk of adversely affect human health

b. Relevant pollutants in soils and (ground)water are removed, controlled, contained and/or diminished using mechanical, chemical, biological or other methods so that the contaminated area (land, water body or other), taking into account its use at the

time of the damage or approved future use of the area, no longer poses any significant risk of adversely affecting human health

4. The level of depollution and pollution prevention and control to be achieved under 3a. and b. above are defined by:

    a. National regulatory standards OR, where these standards are not available,

    b. A risk-assessment taking into account the characteristic and the extent of the impacted area (land, water body or other), the type, properties (persistence, mobility and toxicity) and concentration of the substances, preparations, organisms or micro- organisms, possible migration pathways and the probability of dispersion[754],[755].

Do no significant harm ('DNSH')

(1) Climate change mitigation	Where relevant (i.e., the landfill body contains significant amounts of biodegradable waste), a system for landfill gas capture and abatement and a monitoring plan for landfill gas leakage is put in place in line with operational and technical requirements of the EU Landfill Directive (1999/31/EC as amended) and other generally accepted international industry standards and practices (e.g., ISWA Landfill Operations Guidelines).
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852

[754] Directive 2004/35/CE on environmental liability with regard to the prevention and remedying of environmental damage, Annex II, point 2.

[755] For remediation activities outside the EU: Unless more stringent standards are mandatory under national legislation, the UNEP Guidance on the management of contaminated sites (UNEP/MC/COP.3/8/Rev.1) - Guidance_Contaminated_Sites_EN.pdf (mercuryconvention.org) shall be applied.

(3) Sustainable use and protection of water and marine resources	DNSH as set out in Appending B of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852 More specifically, remedial measures are protective of water and marine resources and apply best industry practices and technology* with the aim of: a) reducing the generation of leachates from the landfill and avoiding outflow/infiltration of leachates into the surrounding soil and thus any potential hazard to groundwater and surface water b) separately collecting and appropriately treating run-off water and leachates before discharge c) tracking and analysing leachate generation rates and leachate concentration and composition in the after-care period through appropriate control and monitoring systems and processes d) separately collecting and appropriately treating of polluted soil in and around the landfill in order to block the pathway from the landfill to waterbodies through heavily soaked soil. * Best industry practice and technology for landfill operations as described in the EU Landfill Directive (1999/31/EC as amended), in particular its Annex I and III, and other generally accepted international industry standards (e.g. ISWA Landfill Operations Guidelines)
(4) Transition to circular economy	N/A
(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appending D of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852

Rationale

According to estimates published by EURELCO (European Enhanced Landfill Mining Consortium) in collaboration with I-Cleantech Flanders, the total number of landfills in Europe is likely more than 500,000 a figure that is higher than initially thought. Around 90% of those landfills (450,000) are old landfills predating the EU Landfill Directive, most of which lack the required environmental protection technologies and will eventually require costly remediation. Of the total landfills, around 80% contain municipal solid waste and 20% contain industrial waste and residues.

In its report "A Roadmap for closing waste dumpsites – The World most polluted places", the International Solid Waste Association (ISWA) estimates that roughly 40% of the world's waste (generated by 3-4 billion people) is deposited in dumpsites some of which have enormous dimensions. As an example, the 50 biggest dumpsites affect the daily lives of 64 million people, a population the size of France (see 2014 Waste Atlas Report on the World's 50 biggest dumpsites). As urbanization and population growth will continue, it is expected that at least several hundreds of millions more people will be served by dumpsites, mainly in the developing world.

Environmental pollution from legally non-conforming landfills and dumpsites affects soils, groundwater and natural habitats in their vicinity. The main sources of pollution are the landfill gases and leachates produced from waste deposited inside the landfill body. Landfill gases contain large amounts of methane, which is not only a powerful climate change agent but also a combustible gas. Uncontrolled methane emissions can cause major fires on landfills which release toxic gases into the atmosphere through the uncontrolled combustion of waste. Leachates are generated as rainwater infiltrates through landfill waste and it becomes contaminated with dissolved and suspended matter originating from the waste. Leachates represent complex mixtures of substances including dissolved organic matter, inorganic macro-components, heavy metals and a wide range of xenobiotic organic compounds. A great amount of these substances occurring in landfill leachates is hazardous and toxic to human health and the environment. In the absence of a confining barrier beneath or surrounding the waste disposal site, this leachate can migrate and contaminate underground and surface waters. Moreover, chemicals can bioaccumulate in organisms and be passed along the food chain, eventually reaching humans. Landfills can continue to produce leachate for several

hundred years after they have ceased to operate, making the sustainable management of leachate a long-term problem.

In addition, where landfills are located near the coast or inland waterways, as in many developing countries, non-sanitary landfills and dumpsites also have the potential for spreading pollution globally through leakages of solid waste. While analysis suggests that uncollected waste is the major contributor to ocean plastic, another driver of this problem is the leakage from underdeveloped collection systems.

In conclusion, it can be safely stated that failure to properly remediate legally non-conforming landfills and dumpsites, even if these have been closed for many years and no longer receiving waste, has the potential to severely pollute the environment and natural habitats, and to damage the health of people that are living in their surroundings.

Given the large number of existing non-sanitary landfills and dumpsites which need to be remediated both inside and outside the EU the proposed activity is deemed to have a very substantial contribution to pollution prevention and control, both at a local and global scale.

It should be noted that:

The closure, technical rehabilitation and after care of landfills that are compliant with the EU Landfill Directive is a legal requirement that is NOT considered a substantial contribution to pollution prevention and control as it is assumed that the mandatory environmental protection and monitoring systems and procedures that are put in place are effective in minimizing environmental pollution and health hazards.

Remediation activities falling under EU Directive on environmental liability (2004/35/CE) are excluded as they constitute a legal requirement for the responsible polluter.

13.7 Depollution and dismantling of end-of-life products for material recovery

Description of the activity

This activity covers the construction, operation and upgrade of facilities dismantling and depolluting complex end-of-life products such as automobiles, electronics and electrical appliances or ships, for materials recovery and/or preparation for re-use of components.

Hence, in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006, the activity can be categorised under one, or multiple, of the following NACE codes:

- E38.31 (which includes the dismantling of wrecks);
- E46.77 (which includes the wholesale of waste scrap);
- E42.9 (which includes the construction of other civil engineering projects).

This includes the dismantling of wrecks of any type (automobiles, ships, computers, televisions and other equipment) for material recovery. Furthermore, it includes the dismantling and depollution of cooling and freezing appliances simply because they contain harmful substances (in particular ozone depleting substances).

This excludes the disposal of used goods, such as refrigerators, to eliminate harmful waste, and the dismantling & deconstruction of civil engineering buildings.

Substantial contribution to transition to circular economy

This activity covers the construction, operation and upgrade of facilities dismantling and depolluting complex end-of-life products such as automobiles, electronics and electrical appliances or ships, for materials recovery and/or preparation for re-use of components. Hence, in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006, the activity can be categorised under one, or multiple, of the following NACE codes:

- E38.31 (which includes the dismantling of wrecks);
- E46.77 (which includes the wholesale of waste scrap);
- E42.9 (which includes the construction of other civil engineering projects).

This includes the dismantling of wrecks of any type (automobiles, ships, computers, televisions and other equipment) for material recovery. Furthermore, it includes the dismantling and depollution of cooling and freezing appliances simply because they contain harmful substances (in particular ozone depleting substances).

This excludes the disposal of used goods, such as refrigerators, to eliminate harmful waste, and the dismantling & deconstruction of civil engineering buildings.

Do no significant harm (‘DNSH’)

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(1) Climate change mitigation	N/A
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852
(3) Sustainable use and protection of water and marine resources	DNSH as set out in Appending B of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852
(5) Pollution prevention and control	The facility is equipped to safely and in an environmentally sound manner manage and store hazardous substances, mixtures and components removed during the depollution operations. **The requirements applicable to specific waste streams are as follows:** **End-of-life vehicles (ELVs)** The facility complies with the requirements for storage, treatment, depollution and treatment operations in order to promote recycling set in Annex I of the ELV Directive 2000/53/EC.* **Waste electrical and electronic equipment (WEEE)** The facility complies with the requirements for selective treatment for materials and components of WEEE set in Annex VII of the WEEE Directive.* The facility complies with normative requirements relevant to its activities for de-pollution provided by: - CLC/EN 50625-1: Collection, logistics & Treatment requirements for WEEE - Part 1: General treatment requirements

	- CLC/EN 50625-2-1: Collection, logistics and treatment requirements for WEEE - Part 2-1: Treatment requirements for lamps - CLC/EN 50625-2-2: Collection, logistics & Treatment requirements for WEEE - Part 2-2: Treatment requirements for WEEE containing CRTs and flat panel displays - CLC/EN 50625-2-3: Collection, logistics & treatment requirements for WEEE - Part 2-3: Treatment requirements for temperature exchange equipment and other WEEE containing VFC and/or VHC - CLC/EN 50625-2-4: Collection, logistics & treatment requirements for WEEE - Part 2-4: Treatment requirements for photovoltaic panels Compliance with regulatory requirements that are equivalent to those set in the EN standards mentioned above is a proof of implementation of such appropriate measures. For the treatment of WEEE containing VFCs and/or VHCs, emissions are within or lower than the emission levels associated with the best available techniques (BAT-AEL) ranges, as set out in the Best Available Techniques Reference Document (BREF) for Waste Treatment[756]. The relevant BAT-AELs include: The BAT-AEL for channelled emissions of TVOC to air from the treatment of WEEE containing VFCs and/or VHCs is set at 3-15 mg/Nm^3.

[756] The Best Available Techniques (BAT) Reference Document (BREF) for Waste Treatment (version of 2018): https://eippcb.jrc.ec.europa.eu/sites/default/files/2019-11/JRC113018_WT_Bref.pdf.

The BAT-AEL for channelled emissions of CFCs to air from the treatment of WEEE containing VFCs and/or VHCs is set at 0.5-10 mg/Nm^3.

For the treatment of WEEE containing mercury, emissions are within or lower than the emission levels associated with the best available techniques (BAT-AEL) ranges, as set out in the Best Available Techniques Reference Document (BREF) for Waste Treatment[757].

The relevant BAT-AELs include:

The BAT-associated emission level (BAT-AEL) for channelled mercury emissions to air from the mechanical treatment of WEEE containing mercury is set at 2-7 µg/Nm^3.

Ship recycling

The facility has set, in accordance with the Ship Recycling Regulation 1257/2013, a 'ship recycling facility plan' that describes the operational processes and procedures involved in ship recycling at the ship recycling facility and that covers in particular workers' safety and training, protection of human health and the environment, roles and responsibilities of personnel, emergency preparedness and response, and systems for monitoring, reporting and record-keeping, taking into account the relevant IMO guidelines and resolutions.

Depollution and dismantling of ship wrecks are carried out in accordance with a ship-specific ship recycling plan set in accordance with article 7 of the Ship Recycling Regulation 1257/2013.

Note: When a specific provision or set of provisions stemming from EU legislation is referenced and if this specific provision or set of provisions is revised, the latest and most stringent provision or set of provisions shall apply at the time the

[757] The Best Available Techniques (BAT) Reference Document (BREF) for Waste Treatment (version of 2018): https://eippcb.jrc.ec.europa.eu/sites/default/files/2019-11/JRC113018_WT_Bref.pdf.

	economic activity is evaluated for the purpose of assessing whether it makes a substantial contribution to the environmental objective at stake.
(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appending D of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852

Rationale

Dismantling of wrecks of any types allows both the targeted removal of components and fluids as well as to recover spare parts which can then be prepared for re-use. The depolluted materials, components and fluids can then be directed to material recovery as well as waste treatment and disposal facilities treatment, depending on the waste fractions at stake.

This activity directly substantially contributes to the transition towards a more circular economy and incidentally to pollution and prevention control by depolluting and dismantling complex end-of-life products into waste fractions which are then directed to adequate treatment facilities (non-hazardous waste fractions and hazardous waste such as batteries, waste oils, decontamination or disposal or POP-containing waste, etc.).

Dismantling of end-of-life products such as cars or electronics is a pre-condition to the preparation for re-use of spare parts (for automotive in particular) or electronics, thus substantially contributing as well to a more circular economy. As shown by EU funded projects such as CWIT for e-waste, only a fraction of WEEE - 35% - of all e-waste discarded in 2012, ended up in the officially reported amounts of collection and recycling systems.

For ships, the EU Ship Recycling Regulation set the most demanding requirements worldwide to properly recycle ships. They aim at ensuring that ship recycling takes place in an environmentally safe and sound manner and restrict or prohibit the use of hazardous materials on ships such as asbestos or ozone-depleting substances. On top of this, the EU Ship Recycling Regulation establishes a list of ship recycling facilities according to which, as from 31 December 2018, ships may only be recycled in one of the facilities listed in the European

list of ship recycling facilities. These facilities are located in both EU and non-EU countries, and must comply with a series of requirements related to workers' safety and environmental protection. The fact that this list also includes facilities outside the EU-27 meeting the requirements set by the EU WSR makes it very much suitable for the purpose of implementing the Taxonomy Regulation (EU) 2020/852.

The BREF on Waste treatment sets the best practices to ensure actors substantially contributing to the circular economy are not significantly harming the climate (via excessive GHG emissions). EU regulation further, already sets high quality standards for dismantlers to ensure pollution prevention during their operations, these are therefore citied as DNSH, alongside EN standards for WEEE treatment, to ensure high standards are fulfilled.

13.8 Sorting and material recovery of non-hazardous waste

Description of the activity

This activity covers the construction, upgrade, and operation of facilities for the sorting and recovery of non-hazardous waste streams into high quality secondary raw materials using a mechanical transformation process. Hence, in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006, the activity can be categorised under one, or both, of the following NACE codes:

- E38.32 (which includes the operation of facilities for the recovery of materials)
- F42.9 (which includes the construction of other civil engineering projects)

Substantial contribution to transition to circular economy

The activity achieves a substantial contribution to the Circular Economy by complying with all of the following four sub-criteria:

Origin of the feedstock material

The activity's non-hazardous waste feedstock originates from one, or multiple, of the following:

- Separately collected and transported waste in source segregated or comingled fractions;[758]
- Non-hazardous waste fractions originating from dismantling and depollution activities from end-of-life products;
- Construction and demolition waste from selective demolition or otherwise segregated at source.

Material recovery

The activity attains or exceeds existing plant-specific material recovery rates by competent authorities set in local waste management plans, permits or contracts or by Extended Producer Responsibility (EPR) schemes. The facility implements Key Performance Indicators (KPIs) to track performance or attainment of applicable recovery rates.

Proper management of waste

The facility recovering non-hazardous waste has implemented all of the following:

i) A waste characterization procedure and a strict waste acceptance procedure regarding the quality of incoming waste,

ii) A tracking system and inventory aiming to track the location and quantity of waste in the plant,

iii) An output quality management system so as to ensure that the output of the waste treatment is in line with applicable quality requirements or standards, using for example existing EN or ISO standards,

iv) The relevant waste segregation measures or procedures to ensure that waste is kept separated depending on its properties in order to enable easier and environmentally safer storage and treatment, and

[758] The activity is in line with Article 10(3) of Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives (OJ L 312, 22.11.2008, p. 3) and the national legislation and waste management plans.

v) The facility has installed the sorting and material recovery technology and process which is specific for the waste stream it processes in order to optimize the quality and quantity of secondary raw materials.

For material recovery facilities recovering co-mingled packaging waste[759], the activity uses advanced sorting technologies such as optical separation by near-infrared spectroscopy or X-ray systems, density separation, magnetic separation, size separation to recover major material fractions (e.g. paper and cardboard, polymers by type, multi-layered packaging, ferrous and non-ferrous metals).

Quality of secondary raw materials

The activity converts or enables the conversion of waste into secondary raw materials that are suitable for the substitution of virgin materials in production processes.

Do no significant harm ('DNSH')

(1) Climate change mitigation	N/A
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852
(3) Sustainable use and protection of water and marine resources	*This criterion is not in the scope of this call for feedback.*

[759] In the Union, the activity is in line with Article 10(3) of Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives (OJ L 312, 22.11.2008, p. 3) and the national legislation and waste management plans.

(5) Pollution prevention and control	*This criterion is not in the scope of this call for feedback.*
(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appending D of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852

Rationale

The material recovery of waste enables the conversion of waste into secondary raw materials that are suitable for the substitution of virgin materials in production processes. This process, therefore, directly reduces the pressure on the environment by reducing:

- The amount of recyclable waste incinerated or disposed in landfill and the associated environmental impacts,[760] as shown by EUROSTAT (env_wastrt) statistics (i.e., countries with high recycling rates generally rely less on landfill and incineration, and vice-versa), and
- The extraction of virgin materials (and their associated emissions), which the secondary raw materials substitute in production processes.

Material Economics[761] provided a report outlining how a circular economy approach can be a "power force" for climate change mitigation. Material recovery processes reducing emissions drastically for steel, plastics, aluminium, among others.

[760] Landfilling practices are nearly always associated to worse environmental performance than alternative disposal and recovery options. Banias, G., *et al.* (2020) "A Life cycle Analysis Approach for the Evaluation of Municipal Solid Waste Management Practices: the case study of the Region of Central Macedonia, Greece". *Sustainability, Vol. 12.*

[761] Material Economics (2018) "The Circular Economy – A power force for climate mitigation". Link here.

The most relevant environmental hotspots for material recovery of non-hazardous waste relate to:

- The quality of the infeed materials which have a direct impact on material recovery (non-separately collected fractions) due to cross-contamination,
- Emissions resulting from material recovery processes (mostly covered by the IED), and
- Proper management of legacy substances but mostly dealt with prior to material recovery itself in many instances (depollution stages).

Based on this, the Technical Screening Criteria are based on ensuring a high-functioning material recovery system for non-hazardous waste to ensure:

- **Quality input (proper collection)** – which has been properly sorted and does not risk cross-contaminating and decreasing the circular economy potential of the waste stream;
- **Material recovery ambition, in-plant** – via the attainment of plant-specific material recovery targets set by competent authorities or EPR when applicable. Plant-specific targets are not broadly applicable across the EU. This is because material recovery rates depend, to a significant extent, on the quality of the input (and obviously of the treatment process itself) and cannot be correlated with the output quality (the most important part of a substantially contributing circular economy) which depends on the process itself, including quality management, and compliance with quality specifications.
- **Proper waste treatment and quality control** – waste management and quality control measures are in place to ensure the high functioning of the economic activity.

Quality output – to ensure that the secondary raw material produced can replace the primary raw material, which makes this activity a substantial contribution.

13.9 Preparation for re-use of end-of-life products and components they are made of having become waste

Description of the activity

Preparing for re-use is an operation or set of operations by which products or components of products that have become waste are prepared so that they can be re-used without any other pre-processing.

Preparation for re-use is the highest waste treatment option on the waste hierarchy (after waste prevention).

Preparation for re-use is not covered by any specific NACE code. Preparation for re-use excludes repair activities as these are performed during the product's use stage. The classification for repair activities of different categories of products therefore not suited to prepare for re-use of end-of-life products nor to the need to develop horizontal technical screening criteria since preparation for re-use directly contributes to the circular economy.

Substantial contribution to transition to circular economy

The activity prepares for re-use products or components of products that have become waste so that they can be re-used without any other pre-processing and achieves a substantial contribution to the Circular Economy by complying with all of the following sub-criteria:

Quality of the feedstock material

The activity's waste feedstock originates from separately collected and transported waste in source segregated or comingled fractions*;

Acceptance, safety and inspection procedures

The activity has implemented:

- A procedure to check the suitability for preparing for re-use or recycling and ensure that discarded end-of-life products not suitable for preparing for re-use are sent for recycling;

The procedure which can be based on visual and/or manual inspection against pre-determined criteria is suited to the category of discarded end-of-life products which are prepared for re-use.

- Proper training and ensures that the re-use operators are qualified for the preparing for re-use activities of the discarded end-of-life products at stake.

Best practices and equipment

The activity uses the tools and equipment suited for the preparing for re-use of discarded end-of-life products and complies, if applicable, with best practices set at European, national or sectorial level under economically viable conditions applicable to the preparing for re-use activity.

System to report recovery rates

The activity has a system to report, if applicable, targets for preparing for re-use and/or recycling set by EU or national legislation.

Suitability of products or components of products to be re-used

The output of the activity are products or components of products which are suitable for re-use without any other pre-processing.

The output by weight of the activity exceeds at least the waste sent for material recovery, energy recovery or landfill.

Preparing for re-use of WEEE

For the preparing for re-use of WEEE, the economic activity is permitted to treat waste and implements an Environmental management system using ISO 14001:2015 and a Quality management system using ISO 9001:2015.

*In the Union, the activity is in line with Article 10(3) of Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives (OJ L 312, 22.11.2008, p. 3) and the national legislation and waste management plans.

Do no significant harm (‘DNSH’)

(1) Climate change mitigation	N/A
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852
(3) Sustainable use and protection of water and marine resources	N/A
(5) Pollution prevention and control	The activity implements safety procedures required to protect the health and safety of workers carrying out preparing for re-use operations (PPC). The activity implements a procedure ensuring that waste non-suitable for re-use is sent for material recovery.
(6) Protection and restoration of biodiversity and ecosystems	N/A

Rationale

Preparation for re-use of end-of-life products is the highest recovery operation in the waste hierarchy for products and components of products having become waste.

Preparation for re-use activities encompass a wide range of end-of-life products from complex products such as components of end-of-life vehicles or electrical appliances and electronics, including printers & cartridges, to discarded textiles undergoing recovery operations including

dismantling, sorting, checking, cleaning and repairing operations so that they can be re-used without any other pre-processing.

Re-use is expressly mentioned by the Taxonomy Regulation (EU) 2020/852 in article 13(e) as substantially contributing to the Circular Economy by prolonging the use of products.

Preparation for re-use contributes to reduce environmental pressure through circular value recovery.

14. Services

14.1 Provision of electrical and electronic equipment through circular business models

Description of the activity

The activity provides electrical and electronic equipment while not transferring the ownership of the equipment in order to substantially increase effective lifetime and/or use intensity of the product.

Substantial contribution to transition to a circular economy
The activity provides the customer with access to and use of the electrical and electronic equipment and, while ensuring the ownership remains with the manufacturer or with an alternative company providing such a service (e.g. a specialist or a retailer). The equipment is offered as a service through, e.g. subscription or renting models. This can be proven by providing a copy of the contract used for the economic activity showing that the customer pays for use of the equipment, the manufacturer or alternative company remains owner thereof, and the manufacturer or alternative company is obliged to take back the equipment after the contract period. In addition, the activity complies with on of the following options: - The activity provides services that substantially increase the product's lifespan in practice by 100% compared to the EU average products' reference service lifetime as defined by EN 50693. OR - The activity provides services that substantially increase product's use intensity at least 100% more intensive practice by 100% compared to the EU average for that product's use intensity.

Evidence showing that the asset offered through this service has a effective lifespan or that product use intensity increased by 100%compared to the EU average for that product category (depending on B2B or B2C context). This assessment is third party assessed.

Do no significant harm (‘DNSH’)	
(1) Climate change mitigation	The manufacturer demonstrates that durability improvement does not negatively impact climate change, by comparing lifecycle climate change impact in kgCO2eq with an average alternative. Lifecycle environmental impacts are calculated and compared using the Commission Recommendation 2013/179/EU following latest guidance, EN50693:2019 or ISO 14040 and 14044 – whichever is the most relevant for that specific product. If the technology is covered by an energy performance standard (such as the EU Energy Label or voluntary energy performance standard), the equipment complies with the top class in terms of energy performance against this standard.
(2) Climate change adaptation	DNSH as set out in Appending A of Annex 1 to the Commission Delegated Regulation (EU) …/… supplementing Regulation (EU) 2020/852.
(3) Sustainable use and protection of water and marine resources	DNSH as set out in Appending B of Annex 1 to the Commission Delegated Regulation (EU) …/… supplementing Regulation (EU) 2020/852. In addition, the manufacturer demonstrates that durability improvement does not negatively impact the objective of protecting water and marine resources, by comparing lifecycle water impact with an average alternative. Lifecycle environmental impacts are calculated and compared using the Commission Recommendation 2013/179/EU following latest guidance, EN50693:2019 or ISO 14040 and 14044 – whichever is the most relevant for that specific product

(5) Pollution prevention and control	DNSH as set out in Appending C of Annex 1 to the Commission Delegated Regulation (EU) …/… supplementing Regulation (EU) 2020/852. In addition, the product shall demonstrate that durability improvement does not negatively the objective of pollution prevention and control, by comparing lifecycle environmental pollution impacts with an average alternative. Lifecycle environmental impacts are calculated and compared using the Commission Recommendation 2013/179/EU following latest guidance, EN50693:2019 or ISO 14040 and 14044 – whichever is the most relevant for that specific product. Relevant indicators are those identified in the PEF pilot project for Uninterrupted Power Supplies (UPS) based on normalization of environmental indicators - aligned with the recommendation of the JRC in the ILCD Handbook: - Potential for mineral abiotic resource depletion in kg Sbeq, - Potential for eutrophication in Phosphate eq, - Non-renewable primary energy consumption in MJ, and - Generation of dangerous waste in kg.
(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appending D of Annex 1 to the Commission Delegated Regulation (EU) …/… supplementing Regulation (EU) 2020/852

Rationale

Through circular business models lifespan and use intensity of both new and existing EEE can be extended. When ownership remains with the manufacturer / retailers, circular design, collection and reuse are incentivised.-In order to keep environmental integrity by avoiding unintended consequences of new business models, an alternative criterion on extended lifespan or extended use intensity in practice has been added.-The criteria:-

- Enable collection of used EEE (TR Art 13 (e) & (g))

- Enable extension of product and component lifespan through better design, (TR Art 13 (b))

Extend product and component lifespan directly, (TR Art 13 (e) & (g))

Any provider of electrical and electronic equipment could potentially be eligible.

The criteria rely on existing and know metrics and methodology

14.2 Provision of repair and maintenance services and of directly related activities

Description of the activity

Economic activities in this category could be associated with several NACE codes, in particular F42, F43, M71, C16, C17, C22, C23, C25, C27, C28, S95.21, S95.22, C33.12 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006 where the objective is 'to return a faulty product to a condition where it can fulfil its intended use' (EN 45554) or carry out preventive measures to maintain the performance of the product or system and prolong its lifetime.

Substantial contribution to transition to a circular economy

Any activity fulfilling at least one of the criteria listed below:

- Repair and maintenance services of products and systems
- Reverse logistics that supports repair or maintenance services qualified under this section
- Predictive maintenance services, software, instruments and devices that monitors the performance and condition of equipment during normal operation to reduce the likelihood of failures. Preventive maintenance can also be called condition-based maintenance.
- Spare part supply beyond legal obligations, through spare part stock management or with 3D printing technologies

Do no significant harm ('DNSH')

(1) Climate change mitigation	Where repair and maintenance services are made on products for which the environmental impact of the manufacturing and end of life phase constitute less than 50% of the product's carbon footprint, a carbon footprint analysis shall be performed to prove life extension is as good as or better than product replacement. Lifecycle analysis can be carried out at the level of a representative product range and can be public LCA data of any comparable product and should focus on relevant LCA impact categories. Lifecycle environmental impacts are calculated and compared using the Commission Recommendation 2013/179/EU or alternatively, ISO 14040 and 14044. Furniture, textiles, and small electronics do not have to apply this criterion.
(2) Climate change adaptation	N/A
(3) Sustainable use and protection of water and marine resources	Where repair and maintenance services are made on products for which the environmental impact of the manufacturing and end of life phase constitute less than 50% of the product's water impacts, an LCA shall be performed to prove that life extension is as good as or better than product replacement. Lifecycle analysis can be carried out at the level of a representative product range and can be public LCA data of any comparable product and should focus on relevant LCA impact categories. Lifecycle environmental impacts are calculated and compared using the Commission Recommendation 2013/179/EU or alternatively, ISO 14040 and 14044. Furniture, textiles, and small electronics do not have to apply this criterion.

(5) Pollution prevention and control	Where repair and maintenance services are made on products for which the environmental impact of the manufacturing and end of life phase constitute less than 50% of the product's pollution impacts, an LCA proves that life extension is as good as or better than product replacement. Lifecycle analysis can be carried out at the level of a representative product range and can be public LCA data of any comparable product and should focus on relevant LCA impact categories. Lifecycle environmental impacts are calculated and compared using the Commission Recommendation 2013/179/EU or alternatively, ISO 14040 and 14044. Furniture, textiles, and small electronics do not have to apply this criterion.
(6) Protection and restoration of biodiversity and ecosystems	N/A

Rationale

Repair is recognised in various EU policies on Circular Economy, such as the Circular Economy Action Plan. The European Parliament recently adopted a resolution calling on the European Commission to grant consumers a right to repair, 'by making repairs more appealing, systematic, and cost-efficient, whether by extending guarantees, providing guarantees for replaced parts, or better access to information on repair and maintenance'.

Repair is high in the '9Rs' hierarchy, referred to in the European Commission's 'Categorisation System for the Circular Economy', before remanufacture, and recycling for instance. The high ranking of repair in this hierarchy is the reason why it is considered a circular activity by nature.

From a circular economy point of view, the activity is always ‘low impact’/’positive impact’. Value retention through product lifetime extension is one of the main circular economy strategies.

However, prolonging the lifetime of products with high impacts during their operation phase might be problematic from an environmental perspective. For instance, energy intensive products can have adverse effects on GHG emissions, when newer alternatives happen to be much more energy efficient (for instance, the repair of fuel oil boilers to extend their lifetime can be detrimental for climate change since much more energy efficient alternatives are already available). The DNSH requirement is meant to capture this hotspot.

Rationale: For products with important impacts during their use phase, we are not considering the activity as ‘environmentally sustainable’ by default. For these products (such as highly polluting thermal engine cars, or energy intensive household equipment), lifetime extension needs to ‘make sense’ from an environmental point of view. Therefore, the DNSH criteria for these products are more stringent important.

Some products have much higher embodied carbon than what their emissions are during use (such as small electronics: phones (see https://en.reset.org/knowledge/ecological-impact-mobile-phones), or laptops (see https://www.researchgate.net/publication/329738608_DISCARDED_ENERGY_AND_CO2_EMISSION_DURING_THE_LIFE_CYCLE_OF_LAPTOPS_IN_THE_CONTEXT_OF_PLANNED_OBSOLESCENCE). Others, such as textiles and furniture do not lead to any GHG emissions during their use phase. Therefore, extending their lifetime through repair does not cause significant harm to the climate mitigation objective.

All repair activities are covered under this activity, the substantial contribution criteria are the same regardless of the product at stake.

For the DNSH, a distinction between products with high impacts during their operation and products with low impacts during their operation (compared to the other lifecycle stages) was made to reflect the issue explained above.

The SC criteria are usable as the activity covered here is considered as ‘circular by default’.

The DNSH requirement for climate mitigation was made more usable throughout the process.

It does not apply to a number of ‘low use impact’ products.

It allows taxonomy users to use the LCA data of a ‘representative product’ without having to carry out a fully fledge, third party verified LCA.