PLATFORM ON
SUSTAINABLE FINANCE

PLATFORM ON SUSTAINABLE FINANCE: TECHNICAL WORKING GROUP

PART B – Annex: Technical Screening Criteria

March 2022

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;**
- **01.50 – 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

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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 the agricultural holding on which the activity is undertaken:

- Maintains or improves biodiversity via extensive grazing in habitats where grazing is beneficial for biodiversity (Option A) AND ensures alignment in respect of a number of other aspects COMMON TO options A, B and C; *OR*
- Is farming rare breeds (Option B) AND ensures alignment in respect of a number of other aspects COMMON TO options A, B and C; *OR*
- Ensures a sustainable farm-gate nitrogen balance (Option C) 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.

An agricultural or farm holding ('the holding') is a single unit, both technically and economically, that has a single management and undertakes agricultural activities classified under the NACE codes listed above, either as its primary or secondary activities.[1, 2]

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

- Satisfy **all** the criteria described in Table 1 AND Table 3; *OR*
- Satisfy **all** the criteria described in Table 2 AND Table 3.

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.

This is illustrated in Figure 1.

Option C is currently in development so criteria are not presented here. Further information on this option is given in the 'Rationale' section below.

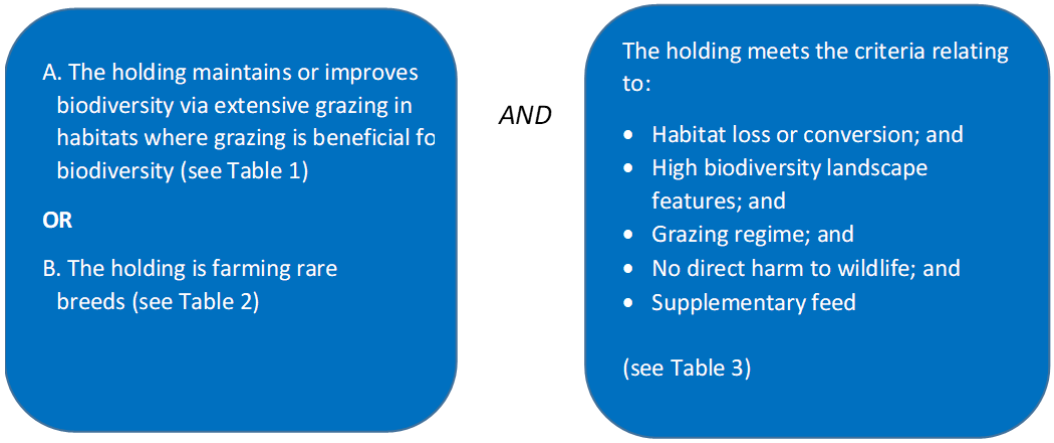
[1] This definition is taken from REGULATION (EU) 2018/ 1091 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL - of 18 July 2018 - on integrated farm statistics and repealing Regulations (EC) No 1166 / 2008 and (EU) No 1337 / 2011 (europa.eu) and was adopted by Eurostat https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Agricultural_holding. It is also used within the framework of the farm accountancy data network under the Common Agriculture Policy. The significant variations between the definition for Regulation and Eurostat and this formulation are 1) the removal of the clause ' within the territory of the Union' as the Taxonomy and these criteria are intended to be interoperable globally, 2) a more precise alignment of the scope of agricultural activities with the NACE codes in the scope of this criteria.

[2] Additional guidance on interpreting this definition is as follows:

- In general, a single unit both technically and economically is indicated by a common use of labour and means of production (machinery, buildings or land, etc.)
- There can be single management even though this is carried out by two or more persons acting jointly
- Where agricultural holdings utilise agricultural area (or livestock) in different regions; the holding is treated as one unit as long as it remains a single unit both technically and economically (common use of the means of production) and operates under single management
- Holdings that for tax or other reasons are split up among two or more persons, but still have a single management (one common manager) and are therefore considered to be one economic unit (single holding)
- Two or more separate holdings, each having previously been an independent holding, that have been integrated into the hands of a single holder, are considered to be a single holding if they now have a common manager or if they use the same labour and equipment (single management and technical and economic unity)
- Agricultural holdings of research institutes, sanatoria and convalescent homes, religious communities, schools and prisons and agricultural holdings which form part of industrial enterprises are included
- Common land consisting of pasture, horticultural or other utilised agricultural area, provided that such utilised agricultural area is operated as an agricultural holding by the local authority concerned (e.g., by the taking in of another persons' cattle to graze as in "taking of animals into assignment") is included
- Common land units (a virtual entity created for the purposes of data collection and recording, consisting of the utilised agricultural area used by agricultural holdings but not belonging directly to them) are included
- "Single-product group-holdings" if they are independent of the "parent" holdings and they mainly use their own factors of production and do not rely mainly on the factors of production of the "parent" holdings are deemed as a holding in their own right
- Migrating herds, which do not belong to holdings using agricultural areas (independent holdings) are included

Taken from Eurostat guidance: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Agricultural_holding

Figure 1: Conditions under which the activity is compliant



Demonstrating compliance: A spatial and temporal Farm Sustainability Management Plan (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.

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 Management 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.

In terms of the timing and frequency of verification, where disclosure relates to a specific investment, verification is undertaken at the beginning of the investment period and every three years thereafter. Where assessment is required under the Non-Financial Reporting Directive (NFRD) or CSRD undertakings (Art. 8 TR), verification is undertaken at the time of the first disclosure or compliance with the criteria and every three years thereafter.

In order to reduce costs, verification of compliance with these criteria may be performed together with any other audit or certification. If a particular criterion is already covered by an

existing scheme or Regulation that requires verification by an independent third party or nationally competent authority, derogation of verification to that scheme or Regulation is permitted for that particular criterion.

Group verification is permitted for groups of holdings where the maximum distance between the nearest individual plots of land of the participating holdings is 10km. For clarification, each participating holding must meet the criteria specified below in their own right. This provision is simply aimed at reducing administrative burdens and costs.

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[3], are not converted. 6. 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 Appendix A of Annex I to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.
(3) Sustainable use and protection of	DNSH as set out in Appendix B of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.

[3] In accordance with Article 29, paragraphs 4 and 5 of Directive (EU) 2018/2001.

water and marine resources	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. Where the permit specifies conditions to avoid significant impact on water bodies, these are followed. 2. If the holding is located in a WEI+[4] river basin area 20% or above (or equivalent), no other water abstraction than water harvesting is considered.[5.] Additionally, any rainwater harvesting system[6] must be authorised by the relevant authority, specifying conditions to avoid significant impact on water bodies. 3. 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.[7]

[4] https://ec.europa.eu/eurostat/web/products-datasets/-/sdg_06_60 The Water Exploitation Index plus (WEI+) is a measure of total fresh water use as a percentage of the renewable freshwater resources (groundwater and surface water) at a given time and place. It quantifies how much water is abstracted and how much water is returned after use to the environment. The difference between water abstraction and return is regarded as water use and illustrates the pressure on renewable freshwater resources due to water demand. In the absence of Europe-wide agreed formal targets, values above 20% are generally considered as an indication of water scarcity, while values equal or bigger than 40% indicate situations of severe water scarcity, i.e. the use of freshwater resources is clearly unsustainable. The indicator is presented as annual average values. Annual calculations at national level, however, cannot reflect uneven spatial and seasonal distribution of resources and may therefore mask water scarcity that occurs on a seasonal or regional basis. The indicator is a result of estimations by EEA based on data from the WISE SoE - Water quantity database (WISE 3) and other open sources (JRC, Eurostat, OECD, FAO) and including gap filling methods.

[5] Water Framework Directive (2000/60/EC) establishes co-ordinated objectives for the good status for all waters. It considers that there is only a certain amount of recharge into a groundwater each year, and of this recharge, some is needed to support connected ecosystems (whether they be surface water bodies, or terrestrial systems such as wetlands). For good management, only that portion of the overall recharge not needed by the ecology can be abstracted - this is the sustainable resource, and the Directive limits abstraction to that quantity. This criterion contributes to comply with the Water Frame Directive requirement regarding the quantitative status of groundwater and surface waters at farm management level.

[6] Rainwater harvesting system: on-site rainwater collection for the use of a variety of applications, particularly irrigation and/or drinking of livestock.

[7] “The competent conservation authority” is the jurisdictionally competent governmental body in charge of nature conservation - such as nature conservation agency, wildlife service, conservation department of environment ministry or similar

	4. No physical 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.
(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.[8] 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.
(5) Pollution prevention and control	DNSH as set out in Appendic C of Annex I to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852. AND All criteria in the ***Supplementary Material*** of this document AND

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

	1. Farm holdings falling under Annex I of IED Directive 2010/75/EU on industrial emissions (IED), specifically for Intensive Rearing of Poultry or Pigs, shall operate in accordance with the emission levels set out in best available techniques. 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.[9] The Farm Sustainability Management Plan identifies the management practices or other measures that ensure compliance with these criteria.
Rationale	

[9] 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, 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)

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.[10] 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 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.[11] More specifically, animal production impacts on biodiversity and ecosystems through land conversion, crop, soil,

[10] EIP-AGRI Focus Group Mixed farming systems: livestock/cash crops FINAL REPORT MAY 2017

[11] E. Crenna, T. Sinkko, S. Sala, Biodiversity impacts due to food consumption in Europe, Journal of Cleaner Production, Volume 227, 2019, Pages 378-391, ISSN 0959-6526

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.[12] 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.[13]
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 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[14]
6. Other management practices harming biodiversity[15] – 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.

[12] European Commission, Directorate-General for Agriculture and Rural Development, Peyraud, J., MacLeod, M., Future of EU livestock : How to contribute to a sustainable agricultural sector ? : final report, Publications Office, 2020, P2 Executive Summary

[13] Almost all the world rangeland is degraded to varying extent due to excessive number of livestock and/or bad management. See for example: Rob Alkemadea, Robin S. Reidb, Maurits van den Berga, Jan de Leeuwc, and Michel Jeuken (2013). Assessing the impacts of livestock production on biodiversity in rangeland ecosystems. PNAS Vol. 110 | No. 52

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

[15] While less of a problem in Europe, this is a significant problem in many parts of the world. See for example Vasquez, Edward & James, Jeremy & Monaco, Thomas & Cummings, D.. (2010). Invasive Plants on Rangelands: A Global Threat. Rangelands. 32. 10.2111/RANGELANDS-D-09-00006.1.

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.[16]

A substantial contribution

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:

- 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 / OR
- 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[17]:

- 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 strategy[18] (part of the European Green Deal) which highlights the urgent need to reduce dependency on pesticides and antimicrobials,

[16] European Commission, Directorate-General for Agriculture and Rural Development, Peyraud, J., MacLeod, M., Future of EU livestock : How to contribute to a sustainable agricultural sector ? : final report, Publications Office, 2020, P20

[17] COM/2020/380 https://eurlex.europa.eu/legalcontent/EN/TXT/?qid=1590574123338&uri=CELEX:52020DC0380

[18] f2f_action-plan_2020_strategy-info_en.pdf (europa.eu)

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)[19] 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.[20]

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.[21] 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.

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 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

[19] Basch, G., T. Friedrich, A. Kassam, and E. Gonzalez-Sanchez. 2015. Conservation Agriculture in Europe. Pages 357–390 *in* M. Farooq and H. S. Kadambot, editors. Conservation Agriculture. Springer International Publishing, Basel, Switzerland.

[20] Hevia, Violeta & Bosch, Jordi & Azcárate, Francisco & Fernández, Eva & Rodrigo, Anselm & Barril-Graells, Helena & González, José. (2016). Bee diversity and abundance in a livestock drove road and its impact on pollination and seed set in adjacent sunflower fields. Agriculture, Ecosystems & Environment. 232. 10.1016/j.agee.2016.08.021.

[21] FAO. 2015. The Second Report on the State of the World’s Animal Genetic Resources for Food and Agriculture, edited by B.D. Scherf & D. Pilling. FAO Commission on Genetic Resources for Food and Agriculture Assessments. Rome

genetic diversity may also enhance the capacity of ecosystem to adapt to pest and disease outbreaks risks.[22]

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]

A note on work in progress 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.[23] 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.[24] Such impacts affect not only local ecosystems in the region where nitrogen is emitted, but also regions very far away through air transmitted ammonia and also through water-bound nitrogen traveling by rivers into seas, leading there to eutrophication.

Many EU Directives aim to tackle excess nutrients and their consequences. The EU Nitrates Directive[25] aims to reduce water pollution by nitrates from agricultural sources and prevent

[22] The animal welfare and environmental benefits of Pasture for Life farming – interim findings. August 2018. Compiled by the Pasture-Fed Livestock Association (PFLA) with contributions from Rob Havard, Anna Heaton, Dr. John Meadley, Paul Silcock, Dave Stanley, Dr. Steve Webster and Dr. Angela Wright. the-animal-welfare-and-environmental-benefits-of-pasture-for-life-farming.pdf (agricology.co.uk)

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

[24] NB, Dise & Ashmore, Mike & Belyazid, Salim & Bleeker, Albert & Bobbink, Roland & W, deVries & Erisman, Jan Willem & Spranger, T. & C, Stevens & Berg, Leon. (2011). Nitrogen deposition as a threat to European Terrestrial Biodiversity. In book: European Nitrogen Assessment (pp.463-494) Chapter: 20

[25] Council Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources (the Nitrates Directive)

pollution of ground and surface waters. The EU Water Framework Directive[26] aims at protecting and restoring the quality of all inland and coastal waters across Europe, and the National Emissions Ceilings (NEC) Directive[27] 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.[28]

For the EU-Commission the reduction of nutrients losses is one of the major goals of the EU Biodiversity Strategy to 2030. With it, it aims to reduce nutrient losses by at least 50%, while reducing the use of fertilisers by at least 20% by 2030.

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. The option being developed proposes a way with which farms have guidelines which lead to an effective and efficient use of nitrogen, minimizing losses.

In August 2021 criteria for ensuring a sustainable farm-gate nitrogen balance were put forward for public consultation.[29] This approach was based on farm-gate surplus-limits (N-input - N-output) giving the farmers the possibility to choose the necessary and targeted N-reduction measures on their farms. Additionally, the approach differentiated surplus limits according to type of fertilizer (manure or mineral) and prevalent manure on the farm, defining overall surplus limits to ensure a sustainable livestock-area-balance. These tailored limits are needed to incentivize the better use of organic manure, after which mineral fertilizer and thus the overall amount of nitrogen entering the nitrogen cycle can be reduced.

The feedback that the proposal received, generally–supported the sustainable farm-gate-balance approach as a promising way to reduce agricultural nitrogen but criticised the absence of regionally differentiated surplus limits, for 1) not complying with EU-legislation (especially with the European Court of Justice's ruling on case C-543/16 (21 June 2018)) and 2) not taking

[26] Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy" or, for short, the EU Water Framework Directive (WFD)

[27] National Emissions reduction Commitments (NEC) Directive (2016/2284/EU) EUR-Lex - 32016L2284 - EN - EUR-Lex (europa.eu)

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

[29] For details see: Platform on sustainable finance: technical working group (2021): Part B – Annex: Full list of technical screening criteria. Call for feedback by the Platform on Sustainable Finance on preliminary recommendations for technical screening criteria for the EU taxonomy | European Commission (europa.eu)

into account how nutrient flows may be affected by regional differences such as soil, climate or slope.

As a result, work is ongoing to develop regionally differentiated surplus limits. These would take account of 1) the capacity of different ecosystems in buffering nitrogen pollution, 2) the differing pollution impact of nitrogen which varies depending on soil, slope and climate, and 3) the locally varying N pollution from other sectors which affects the “allowable” N losses from agriculture. The framework for this is described below and fully detailed criteria will follow. The inclusion of Option C alongside Options A and B will greatly assist in providing opportunities for all agricultural holdings, including landless farms, to comply with the EU Taxonomy.

A regionalisation approach for the nitrogen-farm-gate-balance will be proposed that is based on a geographically highly resolved data set of critical nitrogen surpluses. In a recent study, DeVries et al.[30] modelled regionally explicit critical N surpluses which depend on the one hand on environmental thresholds for air and water (either derived from EU-legislation or from values derived from scientific literature) and on the other hand on the regional specifics determining the regional impact of nitrogen. The authors were with this able to calculate critical N surpluses for ca. 40,000 Nitrogen Calculation Units (NCUs), which are clusters of 1 km × 1 km pixels with identical soil type, slope class and altitude class within a NUTS3 region.

For the determination of the local and taxonomy-relevant farm-specific surplus limits, these values can be used directly, but an adaptation is suggested as 1) The uncertainty for the results on the lowest calculation level of 1 kmx1 km is high and 2) global/EU-data sets on soil, slope and climate can never reach the accuracy of the data that the farmers have locally at hand. The proposed approach for assessing specific farm surplus limit is therefore the integration of an algorithm in a virtual tool that uses on the one hand local and verified data on soil, climate, slope of the cropping land provided by the farmer and on the other hand the relevant data from DeVries et al. (2021) on regional thresholds to calculate farm-specific and concrete surplus limits.

[30] Wim de Vries, Lena Schulte-Uebbing, Hans Kros, Jan Cees Voogd, Geertrui Louwagie, Spatially explicit boundaries for agricultural nitrogen inputs in the European Union to meet air and water quality targets, Science of The Total Environment, Volume 786, 2021, 147283, ISSN 0048-9697, https://doi.org/10.1016/j.scitotenv.2021.147283.

DeVries et al. (2021) cover only the EU. But a paper with a global data set from the same authors is now under review and will be published soon.[31]

The critical N-surpluses will take into account critical ammonia emissions in view of nutrient enrichment of terrestrial ecosystems (biodiversity effects) and critical N concentration in surface waters to avoid eutrophication (biodiversity effects). They will not take into account Critical nitrate/nitrogen leaching to groundwater as we are targeting biodiversity where groundwater is not usually relevant. The final relevant regionalised critical surplus limit will be the minimum of a. and b. as we want to make sure that neither water nor air pollution leads to adverse ecological impacts. This will then be combined with local farm-specific data on prevalent manure on the farm and farming system (cropping, mixed farming …) to derive the final, localised surplus limit.

A note for future application: This option is being 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.

[31] A first publication on the global data set can be found here: https://research.wur.nl/en/publications/managing-nitrogen-to-keep-food-production-within-environmental-li. Schulte-Uebbing, L. F. (2021). Managing nitrogen to keep food production within environmental limits. Wageningen University. https://doi.org/10.18174/544138

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.

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, and reference to local circumstances and authorities as appropriate, 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 and 3.

Recommendations for consideration for future phases of criteria development

Nitrogen and phosphorus should be in line with sustainable farm-gate balance for the reasons described above. Work is in train to 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.

In addition, the following option was discussed and believed to have merit in terms of delivering a substantial contribution to Biodiversity and Ecosystems and would merit consideration for inclusion in the Taxonomy at a later date.

Insect farming

Studies have indicated the potential of insect farming and consumption. E.g., Insect farming may result in fewer greenhouse gas emissions, require less water and space, represent a much lower economic investment, and have a higher efficiency in the feed conversion rate relative to conventional livestock agriculture. According to the FAO, entomophagy offers great potential for a sustainable nutrition. 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.[32.] 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

[32] Arnold van Huis Joost Van Itterbeeck Harmke Klunder Esther Mertens Afton Halloran Giulia Muir and Paul Vantomme. Food and Agriculture Organization of the United Nations Rome, 2013. Edible insects: Future prospects for food and feed security

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.[33]

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.[34] 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. Biodiversity rich farmed area	
1.1 At least 50% of the holding is under a combination of the following biodiversity rich farmland categories. In addition, each parcel of land within the holding that is more than 5km from any other parcel of land within the holding must meet this requirement within its own area.	These criteria cover high biodiversity agroecological semi-natural systems in which grazing is required to maintain high biodiversity characteristics. 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).

[33] Berggren Å, Jansson A and Low M. 2019. Approaching ecological sustainability in the emerging insects-as-food industry. Trends in Ecology and Evolution 34: 132-138

[34] Berggren Å, Jansson A and Low M. 2019. Approaching ecological sustainability in the emerging insects-as-food industry. Trends in Ecology and Evolution 34: 132-138

This combination must include categories A and/or B, plus D, where: • Category A is Biodiverse permanent grassland • Category B is Biodiverse non-grassland semi-natural habitat used for grazing • Category C is Land managed for threatened and endangered species under an official conservation scheme • Category D is Non-productive High Biodiversity Landscape Features (npHBLF). It is also noted that per the criteria in section 2.1 in Table 3, at least 10% of the holding must be under category D. See Table 3 for full details. Categories A-D are further described below. **Category A) Biodiverse permanent grassland** These are composed of perennial or self-seeding native annual forage species which may persist indefinitely, may be natural (such as savannah, steppe, pampas, prairie) or semi-natural (such as alpine meadows, dehesa, hay meadows) and can include agro-silvo-pastural systems of high biodiversity such as dehesa/montado and traditional tall fruit tree orchards with natural vegetation soil cover. These must be unimproved – not tilled for a minimum of 5 uninterrupted years, and not subjected to fertilisation, mulching, re-seeding, or the addition of liming agents, pesticides,	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.[44] Other systems or habitats which cannot be grazed without damaging biodiversity are excluded. The categories of biodiverse land areas included in the 50% opposite, include those biodiverse grazed areas (pasture, A; non-pasture, B) as well as areas under an official conservation scheme (C), and non-productive high-biodiversity landscape features (npHBLF) (D). **On the 50% threshold** Unlike in Crop Production, where intensively cropped area is unlikely to offer much resource to wildlife (and therefore a higher requirement for npHBLF is required, but a lower requirement for overall biodiverse area is pragmatic), grazing systems that are not over-stocked and improved, *are* semi-natural ecosystems of biodiversity value, and the activity requires substantial area of it. At least 50% is a pragmatic requirement that ensures the emphasis of the animal production activity is on such biodiversity-positive grazing and the extensive lands required for it are not replaced. Some additional flexibility is permitted by including npHBLF within the 50% (which as well as being intrinsically beneficial for biodiversity also often synergise with grazed areas to improve usability of land for more species (see below)), as well as any area under

[44] 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.)

herbicides or other substances capable of altering the natural species composition.[35] Excluded from this are: i) Any grassland dominated by non-native species, or "improved" through fertiliser, mulch, seeds, pesticides, herbicides or other artificial inputs ii) Biodiversity poor semi-natural "ruderal grasslands" resulting from the degradation of higher value ecosystems (such as Madagascan grasslands that follow deforestation, post-forest Amazonian grasslands composed of *Hyparrehnia rufa* from Africa, etc)[36] iii) Natural grasslands not yet exploited by livestock and with intact grazing regimes of wild grazers (such as savannah, steppe, prairie, pampa, etc). **Included is the conversion of improved pasture, or other cultivated or degraded land,**	official conservation schemes (which can vary substantially in what they focus on). Any less than 50% of a holding making a direct contribution to biodiversity through these categories would indicate an operation that is not predominantly based on semi-natural ecosystems but more likely to be dominated by biodiversity-poor "improved pasture", non-agroecosystem measures such as intensive production units, feed-lots and other non-agroecosystem infrastructure, or other activities entirely. A mixed farming holding, however, can choose to be taxonomy compliant either through submitting its animal activity in these criteria, or its cropping activity in the Crop Production criteria (or both, providing all criteria are met). A mixed farm will very likely find it easier to comply with the Crop Production criteria because it could submit its semi-natural pasture as one of the biodiverse land categories.

[35] The definition of "biodiverse permanent grassland" given is based on various consistent definitions. CAP Direct Payments (Reg EU: 1307/2013, Article 4, 1h) defines permanent grassland as "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". "Biodiverse grassland" has been taken to be natural and semi-natural: Lesschen et al. (2013), of Wageningen University, undertaking work for the EC to define and classify grasslands in Europe, conclude that ecologically valuable grasslands "are semi-natural and natural grasslands that are not agriculturally improved (e.g., through cultivation, reseeding, fertilisation, irrigation and drainage) of long standing and species rich (taking account of all taxa not only higher plants)." See Lesschen, P. et al. (2014). Task 1 - Defining and classifying grasslands in Europe. Alterra – part of Wageningen UR. (This research was implemented in the framework of Grassdate Project (2012/S 87-142068) Methodological studies in the field of Agro-Environmental Indicators Lot 2. Grassland areas, production and use.) RED Dir 2018/2001 also requires the species richness of grasslands to be recognised by a competent authority, but we consider this unnecessary for the purposes of this taxonomy provided grasslands are natural or semi-natural. Allen et al. (2011) define natural and semi-natural grasslands as, "Natural grassland (n.): natural ecosystem dominated by indigenous or naturally occurring grasses and other herbaceous species used mainly for grazing by livestock and wildlife"; "Semi-natural pastureland⁄grassland (n.): managed ecosystem dominated by indigenous or naturally occurring grasses and other herbaceous species (cf. Native grassland)." See Allen et al. (2011). An international terminology for grazing lands and grazing animals. Grass and Forage Science.

These definitions are also consistent with RED Dir 2018/2001, Natureserve (2010 - classifying global grasslands for IUCN), and EEA 2016 & 2020. See EEA (2016). Mapping and assessing the condition of Europe's ecosystems: progress and challenges EEA contribution to the implementation of the EU Biodiversity Strategy to 2020. EEA Report No 3/2016 and EEA (2020). State of Nature in the EU: Results from reporting under the nature directives 2013-2018. EEA Report - No 10/2020. European Environmental Agency.

[36] Natureserve describe "ruderal grassland" as: "newly formed grasslands that establish on abandoned agricultural lands or that are formed by recent invasive exotic (neophyte) species. We can distinguish these types of semi-natural grassland as "ruderal grassland." Examples of these kinds of grasslands include Imperata cylindrica or Hyparrenia rufa grasslands of the tropics, and Bromus inermis grasslands of North America. These more "weedy" grasslands rarely contain highly biodiverse grasslands, or if they do, they may be dominated by neophyte or recent invasives that are often seen as reducing overall biodiversity value of grasslands".

to semi-natural, permanent pasture (i.e., unploughed for 5 or more years) provided: ● The criteria on management of semi-natural grassland (Table 3, 1.6) are upheld such that no further tillage or use of agricultural inputs takes place (with the exception of one-off intervention needed for the initial establishment of a native species dominated community, which would not count against the five years without improvement). ● The FSMP sets-out how the principal measures required to transition to a native vegetation community will be undertaken within a calendar year (e.g., such as seeding of native species, removal of persistent exotics, etc) sufficient for the vegetation community to be dominated by native species within three years. **Category B) Biodiverse non-grassland semi-natural habitat used for grazing** Non-grassland habitat such as forest, scrubland and wetlands, may be included when evidence is produced that grazing is necessary to maintain high biodiversity characteristics.[37] Such evidence should be based on and align with guidance by competent conservation authorities and the Farm Sustainability Management Plan should specify the biodiversity objectives pursued (such as control of invasive species, maintenance of a % of	**On npHBLF** npHBLF can provide important vertical and horizontal structural complexity within grazing and grass growing ecosystems, be it through areas of taller sward left ungrazed for a year, or non-herbage features such as scattered shrubs, trees, hedgerows, etc. This structural diversity supports complexity of forage patches, high vegetation diversity, high arthropod diversity and provision of perching structures for effective bird foraging. "Different [bird] species prefer different sward structures depending on where they place their nests, where and how they feed, and how they protect themselves against vegetation".[45] [46] Whinchats, for example, are known to prefer grazing areas which include areas of tall herbage.[47] [48] [49] "The most valuable pastures for nesting birds are structurally varied, containing patches of short and long grass intermixed".[50] This structural diversity within grazing systems helps explain the high biodiversity of extensive grazing systems such as upland High Nature Value farming areas, and such principles can be applied more broadly in grasslands to achieve conservation aims.

[37] In Europe, if the habitat type is listed in Table 1 of Halada et al. (2011) as partially or completely dependent on grazing activity, this would be permissible provided the grazing intensity stipulations (see Table 3, this document) are adhered to as necessary to avoid overgrazing the specific habitat. However, Halada et als list is not exhaustive. of habitats for which grazing may be beneficial and is limited to Europe. See Halada et al. (2011). Which Habitats of European Importance Depend on Agricultural Practices? Biodiversity and Conservation. See also EC (2018): Farming for Natura 2000, for general guidance as well as a reproduction of Halada's list of qualifying habitats (pp.15&16).

45 Newton, I. (2017). Farming and Birds. Collins New Naturalist Library.

46 Benton, T.G., Vickery, J.A. & Wilson, J.D. 2003. Farmland biodiversity: is habitat heterogeneity the key? Trends Ecol. Evol. 18: 182–188.

47 Kinoshita, M. (1997). Vegetational type of Stonechats Saxicola torquata habitat during breeding. Japanese Journal of Ornithology.

48 Murray, C. *et al.* (2015). Vegetation structure influences foraging decisions in a declining grassland bird: the importance of fine-scale habitat and grazing regime. Bird Study, Vol. 63, No. 2, 2016, p. 223-232

49 Oppermann, R. (1990). Suitability of different vegetation structure types as habitat for the Whinchat Saxicola rubetra. Plant Ecology 90.

50 Newton, I. (2017). Farming and Birds. Collins New Naturalist Library.

herbaceous vegetation, fuel load reduction, grazing plan, etc). **Category C) Land managed for threatened and endangered species or habitats under an official conservation scheme** Land managed under a specific conservation scheme, designed or formally endorsed by competent conservation authorities, for the conservation of species or habitats (e.g., habitats and species of Annex 1 of Habitats Directive, or locally applicable equivalents if not in Europe, and species Red Lists). For examples, see EC 2018.[38] The FSMP sets out, with regular monitoring: • Ongoing and time-specific conservation targets • Evidence of successful compliance with conservation targets **Category D) Non-productive High Biodiversity Landscape Features** Non-productive HBLFs are land lying fallow39, hedges, trees and shrubs[40] (isolated / in line / in groups / wooded strips[41]), field margins, riparian	**Regarding the spatial allocation of biodiversity rich farmland categories** To ensure the general ecological functionality of farmland, it is important to reach viable percentages of biodiversity rich farmland, but the spatial distribution of it is also important to ensure populations do not collapse due to habitat fragmentation. **Field size[51]** is also a very important indicator of biodiversity[52] [53], interacting with npHBLF to increase biodiversity more than either factor without the other. For instance, presence of npHBLF alongside small fields increases the likelihood that species can make foraging use of fields whilst nesting / roosting etc in adjacent HBLFs, and these effects are consistent across taxa, regions, and both rare and common species.[54] [55] The more heterogeneous the farming landscape, the better for biodiversity as the further species have to move to feed, the more energy they expend and the less successful their breeding is likely to be56. "[S]mall field sizes are of utter importance to half and maybe even reverse the decline in

38 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.

39 Fallows may be rotational or non-rotational. Fallows may include pasture that is uncut or grazed for at least a year (which we add to the list - see next footnote - because the CAP list was designed for arable and we also need to ensure sward variation in grazed ecosystems (see rationale column). Such longer sward may be in isolation or in combination with (i.e., as a buffer) around other landscape features such as trees.

40 For more on value of shrubs/scrub, see: Šalek *et al.,* 2022.

41 Deadwood from native trees, should be left in-tact (standing or on the tree) or on the ground under the tree canopy (unless there are compelling reasons to remove, such as disease that could affect living trees).

51 The academic literature often uses the term "field size" in a generic sense of grazed or cropped area, regardless of type of livestock or crops, legalities of land ownership, how the area is bordered, etc.

52 Fahrig et al (2015). Farmlands with smaller crop fields have higher within-field biodiversity. Agriculture, Ecosystems and Environment: 200.

53 Martin et al. (2019). Effects of farmland heterogeneity on biodiversity are similar to – or even large than – the effects of farming practices. Agriculture, Ecosystems and Environment: 288.

54 Clough et al (2019). Field sizes and the future of farmland biodiversity in European landscapes. Conservation Letters: 13

55 Sirami et al (2019). Increasing crop heterogeneity enhances multitrophic diversity across agricultural regions. PNAS: 116.

56 Schifferli (2001). Birds breeding in a changing farmland. Acta Ornithologica: 36; 1.

verges, ponds, traditional stone walls, traditional terrace walls, flower strips[42]). They are features primarily for habitat, biodiversity and ecosystems services: If a yield is taken, it is incidental and a by-product to the management of the habitat (e.g., hay cut from fallows). *Criteria on the management of npHBLF are in Table 3.* **1.2 The maximum continuous area lacking biodiversity rich farmland** (per categories A, B, C, D) must not be more than **3 Ha.** However, such limit can be surpassed (for example in strip grazing) as long as maximum width of an area lacking biodiverse features does not exceed 100m. *Key definitions:* *A native, or "indigenous" (syn) species, is one "occurring within its natural range (past or present) and dispersal potential (i.e., within the range it occupies naturally or could occupy without direct or indirect introduction or care by humans)".*[43]	biodiversity". However, generally, "field sizes are still increasing".[57] Farms complying with the taxonomy primarily through provision of habitat (Option A) need to ensure biodiversity functionality at a smaller spatial resolution than other Options for compliance, because many farmland species have to meet their needs within small distances. **The effect of reducing field size from 5 to 2.8 Ha, for instance, can be as strong as the effect of increasing HBLF from 0.5 to 11%**58 (a study considering 7 taxa from producers to predators in 435 landscapes in 8 regions - in France, Germany, Spain, UK and Canada).[59] The smaller the field size, the better: between 0.25 Ha (50m^2) and 2.8 Ha (167m^2), much diversity is already likely to have been lost, though less so with more inclusion of HBLF (see figure, below). The effect of field size on biodiversity is greatest in the range of 0.25Ha to 3Ha (Option A) – beyond which a clear threshold of biodiversity loss is crossed.[60]

[42] The vegetation component of these all to be native species (i.e. dominant components of trees, hedges, riparian verges). This list is based on types of areas and landscape features that qualify for Ecological Focus Areas in the CAP (see Delegated Regulation (EU) 639/2014, Section 4).

[43] IUCN 2000. Guidelines for the Prevention of Biodiversity Loss Caused by Alien Invasive Species (2000). Approved by the IUCN Council, Feb 2000. Cited on the Convention of Biological Diversity's Glossary: https://www.cbd.int/invasive/terms.shtml visited January 2022.

[57] Clough et al (2019). Field sizes and the future of farmland biodiversity in European landscapes. Conservation Letters: 13

[58] Sirami et al (2019). Increasing crop heterogeneity enhances multitrophic diversity across agricultural regions. PNAS: 116.

[59] Sirami et al (2019). Increasing crop heterogeneity enhances multitrophic diversity across agricultural regions. PNAS: 116.

[60] See also Clough et al (2019). Field sizes and the future of farmland biodiversity in European landscapes. Conservation Letters: 13

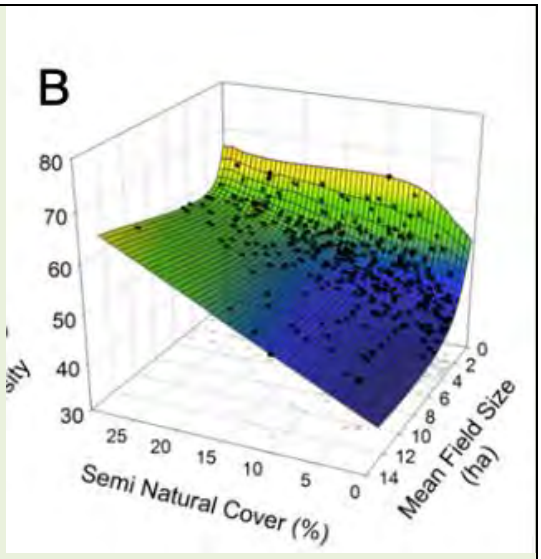


Figure. Relationship of field size and multi-taxa biodiversity index (y axis). Source: Sirami et al., 2019.[61]

The "either, or" option allows farmers to maintain efficiencies through potentially very long grazing compartments, if they wish to have larger areas unbroken by npHBLF.[62] Although 100m is beyond the range of some farm species, those should at least be able to forage from adjacent HBLF into the centre of the field (albeit with less overlapping of foraging ranges from multiple HBLFs on different field margins, which would be optimum). The measure of maximum width without HBLF improves the chances of the entire land area making a contribution to functional biodiversity, even in very large cropping areas.

The most vulnerable species are those with low dispersal distances, such as pollinators, orthopterans and grassland forbs, which are often an important food base for farmland birds. Important grassland forbs such as yellow rattle, orchids, helleborines, etc, often have very small dispersal distances, often less than a metre (e.g., 3 species of

[61] Sirami et al (2019). Increasing crop heterogeneity enhances multitrophic diversity across agricultural regions. PNAS: 116.

[62] See various papers cited in Clough et al (2019). Field sizes and the future of farmland biodiversity in European landscapes. Conservation Letters: 13

	orchids[63]). Orthopterans such as bush crickets react very badly even to small scale fragmentation, requiring gaps between habitat of no larger than 10m64. Small bees react on scales of 100-300m.[65] [66] [67] [68] Forexample, various farm birds have very limited foraging ranges from nest-sites. Results from studies include: Skylarks, female – 54m[69]; Red-backed shrike – 57m, averaging only 26m when rearing young; Yellow-hammer – 82m; Goldfinch – less than 100m; corn bunting (whilst breeding), water pipit, hoopoe – all often less than 200m7071. Small and medium-sized butterflies have strong limitations on their dispersal range: small species such as blues and coppers – 49m; medium species such as skippers, 86m72, and the vast majority of false ringlets disperse less than 100m.[73]

[63] Jersáková, J. and Malinová, T. (2007), Spatial aspects of seed dispersal and seedling recruitment in orchids. New Phytologist, 176: 237-241. https://doi.org/10.1111/j.1469-8137.2007.02223.x

[64] Braschler B., Marini L., Thommen G.H., Baur B. (2009): Effects of small-scale grassland fragmentation and frequent mowing on population density and species diversity of orthopterans: a long-term study. Ecological Entomology 34: 321–329.

[65] Benjamin, F.E., Reilly, J.R., Winfree, R. & Osborne, J. (2014). Pollinator body size mediates the scale at which land use drives crop pollination services. J Appl Ecol, 51, 440-449.

[66] Steffan-Dewenter, I., Münzenberg, U., Bürger, C., Thies, C. & Tscharntke, T. (2002). Scale-dependent effects of landscape context on three pollinator guilds. Ecology, 83, 1421–1432.

[67] Jauker F., Diekötter T., Schwarzbach F., Wolters V. (2009): Pollinator dispersal in an agricultural matrix: opposing responses of wild bees and hoverflies to landscape structure and distance from main habitat. Landscape Ecology 24: 547–555.

[68] Zurbuchen A., Landert L., Klaiber J., Müller A., Hein S., Dorn S. (2010): Maximum foraging ranges in solitary bees: only few individuals have the capability to cover long foraging distances. Biological Conservation 143: 669–676

[69] Jeromin, K. (2002). Zur Ernährungsökologie der Feldlerche (Alauda arvensis L. 1758) in der Reproduktionsphase.

[70] Various papers cited by Schifferli (2001). Birds breeding in a changing farmland. Acta Ornithologica: 36; 1.

[71] Podletnik M., Denac D. (2015): Selection of foraging habitat and diet of the Hoopoe Upupa epops in the mosaic-like cultural landscape of Goričko (NE Slovenia). Acrocephalus 36 (166/167): 109–132.

[72] Sekar & Sandhya (2012): A meta-analysis of the traits affecting dispersal ability in butterflies: can wingspan be used as a proxy? Journal of Animal Ecology, 81, 174–184

[73] Čelik T. (2003): Population structure, migration and conservation of Coenonympha oedippus Fabricius, 1787 (Lepidoptera: Satyridae) in a fragmented landscape. PhD Thesis. University of Ljubljana, Biotechnical Faculty. And Čelik T., Verovnik R. (2010): Distribution, habitat preferences and population ecology of the False Ringlet Coenonympha oedippus (Fabricius, 1787) (Lepidoptera: Nymphalidae) in Slovenia. Oedippus 26: 7-15

1.2. Herbicides are not used in the control of weeds (i.e., undesired native or naturalised plant) species.[74]	

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.** ** These thresholds can be reached across a number of different rare breeds and different species.* Key definitions: 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[75] OR Recognised as at risk based on global classification system E.g., FAO classifications of risk levels[76] OR Below the thresholds for endangered breed set in Annex IV of the de Commission Regulation (EC) No 1974/2006	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.

[74] Except for tackling invasive alien species - in accordance with Table 3

[75] European Farm Animal Biodiversity Information System | Domestic Animal Diversity Information System (DAD-IS) | Food and Agriculture Organization of the United Nations (fao.org)

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

1.2. The breed is part of viable breeding programme for the improvement of breeds aligned with the REGULATION (EU) 2016/1012 on zootechnical and genealogical conditions for the breeding, trade in and entry into the Union of purebred breeding animals, hybrid breeding pigs and the germinal products thereof and for holding outside of EU aligned with the principle of REGULATION (EU) 2016/1012[77] 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 **1.3. The breed is not from cloned animals**	

Table 3: Criteria that apply to options A and B

Criteria	Rationale
1. Minimising habitat loss, conversion and deterioration^	
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[78] 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, 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.)	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.

[77] EUR-Lex - 32016R1012 - EN - EUR-Lex (europa.eu)

[78] 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).

1.3. Drainage **1.3.1. The activity will not lead to any further drainage of moist farm areas**, such as springs, flushes, water meadows, etc. **1.3.2. No increase in drainage efficiency** (meaning the capacity of the drainage system to discharge water volume per unit of time and land) where there may be potential negative impact on moist habitat, such as wet pastures or moist areas of fields where soil-probing bird feed. No new underground drains, tile drains nor other measures such as deepening, straightening, concreting, etc. **1.3.3. The point source outputs of existing subsurface drains do not by-pass riparian zones and discharge directly to any natural water bodies** but are routed through an Integrated Buffer Zone or other nature-based solutions prior to discharge to water bodies. The plant component of the nature-based solution must include only native species	Increasing drainage efficiency reduces habitat for many species (such as snipe, curlew, lapwing, godwit, ruff, corncrake, spotted crake, etc.,[79] and amphibians); increases diffuse pollution to waterways, especially N and P pollution; and increases downstream flooding risks. Drainage activities undertaken in an effort to increase agricultural land area leads to the loss of specialised habitat, and of food supply and breeding sites for species. Wintering birds are particularly affected by ongoing and past drainage activities.[80] Drainage for use as agricultural land has been identified as one of the main pressures for habitats and species. Habitat heterogeneity is crucial in the rural landscape.[81] Integrated buffer zones in dry buffer strips are a valuable modification of dry buffer strips in order to mitigate the adverse impacts of high nutrient loading from agricultural fields on the aquatic environment. They provide additional valuable ecosystem services such as, for instance, flood attenuation by increasing the water storage in agricultural landscapes and by augmenting biodiversity through provision of habitats for amphibians and wetland plants.[82] Various nature-based solutions as nutrient mitigation measures have been implemented as efficient solutions.[83]
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), the following are observed as explained in Farm Sustainability Management Plan and verified by the relevant conservation authority where applicable:	

[79] For instance, see Newton (2017). Farming and Birds. Harper Collins.

[80] State of nature in the EU. Results from reporting under the nature directives 2013-2018. EEA Report - No 10/2020. European Environmental Agency (2020).

[81] Benton, T.G., Vickery, J.A. & Wilson, J.D. 2003. Farmland biodiversity: is habitat heterogeneity the key? Trends Ecol. Evol. 18: 182–188.

[82] Zak, B. Kronvang, M.V. Carstensen, C.C. Hoffmann, A. Kjeldgaard, S.E. Larsen, J. Audet, S. Egemose, C. A. Jorgensen, P. Feuerbach, F. Gertz and H.S. Jensen. (2018). Nitrogen and Phosphorus Removal from Agricultural Runoff in Integrated Buffer Zones. D. Environmental Science and Technology: 52 (11), pp. 6508–6517 (2018).

[83] Hoffmann, D. Zak, B. Kronvang, C. Kjaergaard, M. V. Carstensen and J. Audet. (2020). An overview of nutrient transport mitigation measures for improvement of water quality in Denmark. C.C. Ecological Engineering: 155. 105863.

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[84], where applicable, and necessary mitigation measures[85] have been implemented accordingly.[86]	
1.5 Natural grasslands[87] 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, in which case approval of grazing plan from the conservation authority is required where applicable	
1.6 Semi natural grasslands and biodiverse non-grassland semi-natural habitat used for grazing are not converted to other land use (including to build grey infrastructure) or modified through ploughing, seeding, fertilisers, chemicals, mulching etc, unless a convincing conservation rationale is provided (such as floristic enrichment of impoverished grasslands by spreading of seeds from biodiverse grasslands).	

[84] 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.

[85] Those measures have been identified to ensure that the project/pla N/Activity will not have any significant effects on the conservation objectives of the protected area.

[86] 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.

[87] For grassland definitions, see Table 1.

2. Creation and maintenance of features and areas of high biodiversity value^	
For the application of the criteria below, see Table 1 above for the definitions of npHBLFs (see category D) and other qualifying areas of high biodiversity value (see categories A-C) **2.1. The holding maintains non-productive high biodiversity landscape features (npHBLF) on *at least* 10% of the farm area.** Specifically: • If the current % is below 10%, then 10% npHBLF is reached within a year88. • **If the current area of npHBLF is above 10%, the higher % is**	The inclusion of criteria relating to the creation or enhancement of high-biodiversity landscape features is important as agriculture covers 39% of land area in the EU.[91] The EU Biodiversity Strategy requires at least 10% of agricultural area in the EU to be under high-biodiversity landscape features (npHBLF, herein).[92] Many studies converge on 10-14% npHBLFs at farm scale as a minimum to avoid crossing critical thresholds of biodiversity loss[93] [94] [95], such as: birds[96] [97], hares[98] [99], and pollinating and other insects[100] [101].

[88] This need not be an onerous requirement – npHBLF such as fallows, can be installed very quickly, even if others take longer to develop (such as hedgerows).

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

[92] "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.

[93] Oppermann et al. (2020) Sicherung der Biodiveristät in der Agrarlandschaft, Institut für Agrarökologie und Biodiversität (IFAB). Mannheim, 191 Seiten. ISBN 978-3-00-066368-0ER

[94] Pe'er G, Bonn A, Bruelheide H, et al. (2020). Action needed for the EU Common Agricultural Policy to address sustainability challenges. People Nat. (2) 305–316. https://doi.org/10.1002/pan3.10080

[95] BIOGEA (2020). A green architecture for green infrastructure: how the future CAP could support green and blue infrastructures. (BIOGEA = Testing BIOdiversity Gain of European Agriculture with CAP greening). https://www.adelphi.de/en/publication/green-architecture-green-infrastructure

[96] Aebischer, Nicholas & Ewald, Julie. (2004). Managing the UK Grey Partridge Perdix perdix recovery: Population change, reproduction, habitat and shooting. Ibis. 146. 181 - 191. 10.1111/j.1474-919X.2004.00345.x.

[97] Mechtry-Stier *et al.(*2014). Impact of landscape improvement by agri-environment scheme options on densities of characteristic farmland bird species and brown hare (Lepus europaeus). Agriculture, Ecosystems & Environment 189, 101-109 (https://doi.org/10.1016/j.agee.2014.02.038)

[98] Walker, L.K., Morris, A.J., Cristinacce, A., Dadam, D., Grice, P.V. and Peach, W.J. (2018), Effects of higher-tier agri-environment scheme on the abundance of priority farmland birds. *Anim Conserv*, 21: 183-192. https://doi.org/10.1111/acv.12386

[99] Traba and Morales (2019). The decline of farmland birds in Spain is strongly associated to the loss of fallowland. Scientific reports: 9.

[100] Humbert et al. (2010). Wiesen Ernteprozesse und ihre Wirkung auf die FAuna Herausgeber: Forschungsanstalt Agroscope Reckenholz-Tänikon ART Tänikon, CH-8356 Ettenhausen,Redaktion: Etel Keller, AR (http://www.stiftungnatur.at/content/4-downloads/1273589655_humber_j_y_art_bericht_724_d.pdf).

[101] Pfister et al. (2020) in Oppermann et al. (2020) Sicherung der Biodiveristät in der Agrarlandschaft. Institut für Agrarökologie und Biodiversität (IFAB)

maintained. I.e., Existing npHBLFs are not destroyed or converted. In addition, each parcel of land within the holding that is more than 5km from any other parcel of land within the holding must meet this requirement within its own area. **2.2. The maximum continuous area lacking biodiversity rich area (per categories A, B, C and D) must not be more than 5 Ha** [89] However, such limit can be surpassed (for example in strip cultivation) as long as maximum width of a cropping area lacking biodiverse features, does not exceed 100m. **2.3. Management of npHBLFs** **2.3.1 Semi-permanent npHBLF (such as established trees, hedges, ponds) should be maintained and not replaced by more transient features**.[90] **2.3.2. No use of fertiliser, plant protection products or other chemicals within 10m of npHBLFs** **2.3.3. No vegetation cutting / grazing / mowing during sensitive times of year** such as bird breeding and plant flowering & seed development **2.3.4. Water courses and bodies have buffer-zones sufficient for conservation of riparian community & prevention of**	Further, inclusion of HBLFs can increase crop yields.[102] 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[103]. The share of fallow land in utilised agricultural area (UAA) in the EU27 is 4.1% (Eurostat, 2021), and the estimated UAA covered by landscape features (grass margins, shrub margins, single trees bushes, lines of trees, hedges and ditches) is approx. 0.5%[104]. npHBLFs are spatial features but their integrity also depends on management, to be described in the Farm Sustainability Management Plan and conforming with Table 3 stipulations. The value of good management of npHBLF is also recognised in the Common Agricultural Policy.[105] 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, npHBLF 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, proportionately and with net biodiversity benefit.

[89] Such areas lacking biodiverse landscape categories may be interspersed either with biodiversity rich farmed area (A or B)-or npHBLF (D).

[90] Although the net overall % of area npHBLF cannot be reduced (see Table 3), this stipulation is to discourage loss of longstanding features and replacing them with annually determined features such as flower strips.

[102] Dainese, M. et al. 2019. A global synthesis reveals biodiversity-mediated benefits for crop production. Science Advances (5). DOI: 10.1126/sciadv.aax0121

[103] Pywell, *et al.* (2015). Wildlife friendly farming increases crop yield: evidence for ecological intensification. Royal Society. https://doi.org/10.1098/rspb.2015.1740

[104] Eurostat (2015). LUCAS Land Use and Land Cover Survey. Eurostat Statistics explained, available online at: http://ec.europa.eu/eurostat/statistics-explained/index.php/LUCAS_- _Land_use_and_land_cover_survey

[105] GAEC standards for *good agricultural and environmental condition of land*, cover various of the npHBLF in these criteria. For example, GAEC 9 – prohibits cutting hedges and trees during the bird breeding and nesting season, and suggests measures for avoiding invasive plant species

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: o For ditches: buffers = 5m wide o For small / medium rivers and standing water bodies (up to 15m wide): buffers = 10m o For large water bodies, above 15m wide: buffers = 30m **2.4. Management of all biodiversity rich areas (per categories A-D)** **2.4.1. Invasive alien species are removed to the extent possible without recourse to chemicals** **2.5 Record keeping** The types, extent and condition of the respective biodiversity rich farmland categories must be identified, mapped, described and annually updated in the FSMP, according to the stipulations of the relevant option to compliance. Where the biodiversity rich farmland categories occur within a Natura 2000 site or other protected area, the FSMP must include an explanation of how the types and management of biodiversity rich farmland categories are consistent with the Natura 2000 site/protected area's management objectives (as established by the competent conservation authorities if such exist).	**Regarding spatial allocation of biodiversity rich farmland categories.** **Regarding 5 Ha.** Whilst Option A is set at a lower threshold of diversity loss (3 Ha), the next threshold beyond which the benefit of smaller field sizes is largely lost, is around 6Ha[106], thus 5 Ha retains some benefit prior to this point. Further studies discuss decreases in biodiversity as field size rises to 5.2 Ha[107]. The difference in farmland biodiversity between field sizes of 1 to 6 Ha, is **similar to the difference when moving from 35% to 0% semi-natural habitat cover**[108]**.** So, whilst ensuring 10% npHBLF, we can limit further losses from large fields and improve synergy between npHBLF and farmed areas by placing an upper limit on npHBLF-free areas. **Example 1:** Options for a 5 ha field of 200m by 250m, include: • Adding a fallow strip of 20m width and 250m length, to meet its 10% npHBLF on-site. • Dividing itself into smaller units than 5ha using npHBLF such as flower strips, hedgerows, fallows, tree lines, or such like, which would contribute towards that land area's npHBLF even if not constituting the full 10% (in which case the remaining HBLF quotient needs to be within 5km – see below). • Distributing its 10% npHBLF on-site through other means that may not be to divide the field, such as scattered native trees, or a field corner allocated to native scrub reverting to woodland, or such like. **Example 2**: A farmer could choose to strip-farm a larger-than-5 Ha area, provided it were no more than 100m wide. If have a 100m wide, 1km long farmed area (10 Ha), there would be 2200m of npHBLF around the margin. The farmer could decide whether to meet all the 10% HBLF onsite or not, and if chooses to do so onsite, it could be

[106] Sirami et al (2019). Increasing crop heterogeneity enhances multitrophic diversity across agricultural regions. PNAS: 116.

[107] Fahrig et al (2015). Farmlands with smaller crop fields have higher within-field biodiversity. Agriculture, Ecosystems and Environment: 200.

[108] Many studies are cited in Clough et al (2019). Field sizes and the future of farmland biodiversity in European landscapes. Conservation Letters: 13.

The FSMP must describe how biodiversity rich farmland categories are being created / managed to ensure these criteria are met.	achieved by making those field margin npHBLFs 4.54m wide on average (1 Ha). **Example 3:** A very large, farmed area (e.g., 50 Ha), where the farmer does not wish to install semi-permanent field margins such as hedgerows, could simply be interspersed with flower strips every 100m, either to the extent required to meet the 10% HBLF or allowing part of the 10% to be met off-site. **On ways to reduce npHBLF-free areas: from hedgerows to flower-strips.** Expanses of npHBLF-lacking cropping area may be interspersed either by semi-permanent npHBLF such as hedgerows, tree-strips, dry-stone walls, etc, or by more transient HBLF such as wildflower strips. In this way, the criteria do not assume creation of "fields" with semi-permanent npHBLF borders – although "permanent field edges, especially, act as refuges for many species, including nesting sites and food resources"[109]. However, farmers may instead choose to ensure their npHBLF is met by annual allocation of less permanent npHBLF such as flower strips (see example 3 above). For example, pairs of whitethroat and corn bunting have been shown to increase in proportion to area of wildflower strips[110]. **Re 2.2.2 Spatial limits to land providing biodiverse farmland area** The main objective of these criteria is to ensure animal production that contributes to the conservation of farmland biodiversity. This requires maintaining biodiversity rich farmland categories throughout the farming landscape and considering the geometry of farming systems to enable species to make use of as much land as possible (see above criteria). However, flexibility is given to farmers to decide to meet part of the quotient of biodiversity rich farmland nearby, rather than in, the productive area. After having guaranteed protection of existing npHBLFs, riparian zones, and minimum distances between npHBLFs in the productive grazing area, other areas may be found within

[109] Clough et al (2019). Field sizes and the future of farmland biodiversity in European landscapes. Conservation Letters: 13.

[110] Jenny et al. (1997). Der ökologische Ausgleich in intensive genutzten Ackerbaugebieten der Champagne genevoise GE und des Klettgaus SH und seine Bedeutung für Vögel, Pflanzen und ausgewählte Wirbellose. Swiss Ornithological Institute, Sempach, cited in: Schifferli (2001). Birds breeding in a changing farmland. Acta Ornithologica: 36; 1.

	5km of the productive land through which to meet the obligations. This might be because of a particularly powerful farming or biodiversity rationale (e.g., if nearby lands are particularly biodiverse but not legally protected and would thus benefit from safeguarding). It needs to be clear in the FSMP how each parcel of land being claimed by the activity meets its biodiverse farmland categories either on that parcel or within 5km of it. Geographical limits are needed, however, in order to avoid deferring all measures to locations completely ecologically disconnected to the farmland. By placing this limit within the range of many farmland species, the likelihood is increased of a synergy between the parcel and linked lands: for instance, species might nest in npHBLF a small distance away from the parcel being farmed, but still be able to forage within the productive land of the parcel. Many birds and insects have ranges of less than a couple of hundred meters (see Table 1). Other species operate on scales less than a kilometre, such as parisitoids and syrphid flies - important natural pest control agents and pollinators.[111] [112] [113] [114] [115] A review of the foraging ranges of 61 farm bird species showed only three with a range of as much as 3km, and most ranged 1km or less[116].

[111] Chaplin-Kramer, R., O'Rourke, M.E., Blitzer, E.J. & Kremen, C. (2011). A meta-analysis of crop pest and natural enemy response to landscape complexity. Ecology Letters, 14, 922–932.

[112] Haenke, S., Scheid, B., Schaefer, M., Tscharntke, T. & Thies, C. (2009). Increasing syrphid fly diversity and density in sown flower strips within simple vs. complex landscapes. Journal of Applied Ecology, 46, 1106–1114.

[113] Kleijn, D. & van Langevelde, F. (2006). Interacting effects of landscape context and habitat quality on flower visiting insects in agricultural landscapes. Basic and Applied Ecology, 214–301.

[114] Kruess, A. & Tscharntke, T. (1994). Habitat Fragmentation, Species loss, and Biological Control. Science, 264, 1581-1584.

[115] Thies, C., Roschewitz, I., Tscharntke, T. (2005). The landscape context of cereal aphid-parasitoid interactions. Proc. R. Soc. B, 272, 203-210.

[116] Schifferli (2001). Birds breeding in a changing farmland. Acta Ornithologica: 36; 1.

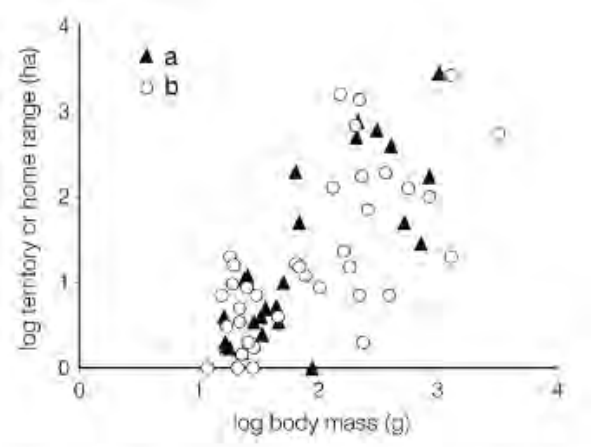


Fig. 2. The size of territory (a) or foraging range (b) in 61 bird species in relation to their body mas. Home range $r^2 = 0.48$, n = 37 species; territory $r^2 = 0.64$, n = 24. Sources are some 50 papers indicated in References.

Figure source: Schifferli (2001).[117]

Non-passerines often have larger ranges than passerines – e.g., barn owls (637m), white storks, 1.3 km; merlin, 1-1.7 km[118]. Scops owls may forage as far as 1.9 km but usually stay within 100-400m, their occurrence decreasing with distance from the nearest hedge[119]. Grey partridge has a core action area of 1 ha, and 2 Ha in breeding season[120] [121] and very few migrate beyond 3km in the autumn[122] [123] [124]. European nightjars have been shown to feed as far as 7km away from their roosting sites, but not by preference due to higher energetic costs and metabolic stress incurred as distances increase:

[117] Schifferli (2001). Birds breeding in a changing farmland. Acta Ornithologica: 36; 1.

[118] Studies cited in Schifferli (2001). Birds breeding in a changing farmland. Acta Ornithologica: 36; 1.

119 Denac K., Kmecl P., Koce U. (2019): Habitat use of Eurasian Scops Owls Otus scops in an agricultural mosaic landscape. Ardea 107(2): 119-129.

[120] Gottschalk, E.; Beeke, W. (2014): Wie ist der drastische Rückgang des Rebhuhns (Perdix perdix) auf-zuhalten? Erfahrungen aus zehn Jahren mit dem Rebhuhnschutzprojekt im Landkreis Göttingen. In: Berichte zum Vogelschutz Bd 51, S. 95–116.

[121] Laux, D.; Herold, M.; Bernshausen, F.; Hormann, M. (2017): Artenhilfskonzept Rebhuhn (Perdix perdix) in Hessen. Gutachten der Staatlichen Vogelschutzwarte für Hessen, Rheinland-Pfalz und Saarland. Hungen. 86 p.

[122] Glutz von Blotzheim, U. N.; Bauer, K. M.; Bezzel, E. (1998): Handbuch der Vögel Mitteleuropas. Wiesbaden: Aula-Verlag.

[123] Hölzinger, J., (2001) Die Vögel Baden-Württembergs- Gefährdung und Schutz, Teil 2 –Artenschutzprogramm. - Verlag Eugen Ulmer.

[124] Laux, D.; Herold, M.; Bernshausen, F.; Hormann, M. (2017): Artenhilfskonzept Rebhuhn (Perdix perdix) in Hessen. Gutachten der Staatlichen Vogelschutzwarte für Hessen, Rheinland-Pfalz und Saarland. Hungen. 86 p.

	"in degraded, homogenized landscapes, birds generally fly further to find food compared to those in diverse landscapes"[125]. Bee species vary in foraging range from hundreds of meters (small bees) to multiple kilometres. European bumble bees usually forage between 750m and 1500m[126] [127] [128] [129], and honeybees have been shown to fly as far as 12km[130] though flight distance is one of the biggest costs for bees to evaluate and optimal foraging prioritises the closest resources possible[131][132]. Brown hares live year-round within a few dozen hectares, from 26ha to 190 ha - i.e., up to 1.3 km^2 [133]. We can see from the above that a great many farm species will not be making inter-site connections beyond 5km. However, it is given as the *maximum* distance. This, combined with the requirements on riparian verges, maintaining existing npHBLFs, and on the spatial configuration of on-site npHBLF, make it more likely that most npHBLF contribution will be occurring within this 5km limit.

[125] Evens et al., 2018. Proximity of breeding and foraging areas affects foraging effort of a crepuscular, insectivorous bird. Scientific Reports: *8:3008* | DOI:10.1038/s41598-018-21321-0

[126] Benjamin, F.E., Reilly, J.R., Winfree, R. & Osborne, J. (2014). Pollinator body size mediates the scale at which land use drives crop pollination services. J Appl Ecol, 51, 440-449.

[127] Carvell, C., Jordan, W.C., Bourke, A.F.G., Pickles, R., Redhead, J.W. & Heard, M.S. (2012). Molecular and spatial analyses reveal links between colony-specific foraging distance and landscape-level resource availability in two bumblebee species. Oikos, 121, 734–742.

[128] Steffan-Dewenter, I., Münzenberg, U., Bürger, C., Thies, C. & Tscharntke, T. (2002). Scale-dependent effects of landscape context on three pollinator guilds. Ecology, 83, 1421–1432.

[129] Osborne, J.L., Martin, A.P., Carreck, N.L., Swain, J.L., Knight, M.E., Goulson, D. et al. (2008). Bumblebee flight distances in relation to the forage landscape.

[130] Greenleaf, S.S., Williams, N.M., Winfree, R. & Kremen, C. (2007). Bee foraging ranges and their relationship to body size. Oecologia, 153, 589–596.

[131] Couvillon et al (2015). Honey bee foraging distance depends on month and forage type. Apidologie (2015) 46:61–70.

[132] Henry, M., Fröchen, M., Maillet-Mezeray, J., Breyne, E., Allier, F., Odoux, J.-F. et al. (2012). Spatial autocorrelation in honeybee foraging activity reveals optimal focus scale for predicting agro-environmental scheme efficiency. Ecological Modelling, 225, 103–114.

[133] Olesen, C.R. & Asferg, T. 2006. Assessing potential causes for the population decline of European brown hare in the agricultural landscape of Europe - a review of the current knowledge. National Environmental Research Institute, Denmark. 32 p. NERI Technical report No. 600. http://www.dmu.dk/Pub/FR600.pdf

	Re. 2.3.4. riparian buffer zones Riparian buffer zones provide crucial habitat and wider ecosystem services.[134] They provide valuable habitat in an ecotone featuring species associated with both the aquatic and the adjacent terrestrial land and the unique edge between the two – such as amphibians, kingfishers, water voles, etc). Riparian habitats provide corridors that contribute to habitat connectivity on a landscape level. They help to safeguard the quality of the aquatic systems by which they occur, through mediating factors on which other species depend such as shade, water temperature and input of biomass (see Parkyn, 2004[135] – which can be particularly important for the resilience of water bodies to global heating. [136] They also contribute to removal of agricultural pollutants that have negative impacts on biodiversity and on human uses for water. The science of riparian zones is detailed, but width is a key factor. On average, riparian buffers of 30m are modelled as 93% effective in removing pesticides from water entering freshwater bodies. Efficacy of sediment, N, P and pesticide removal decreases with smaller buffer zone width, notably declining below 10m.[137] Buffer zones are often more effective at pollution removal when composed of woody vegetation (particularly trees).[138] By allowing natural vegetation to develop in riparian zones, in many cases this will see ecological succession ensuring

[134] Riis *et al.,* (2020). Global Overview of Ecosystem Services Provided by Riparian Vegetation. Bioscience**.**

[135] Parkyn (2004). Review of Riparian Buffer Zone Effectiveness. MAF Technical Paper No: 2004/05.

[136] Restoring (or simply enabling the natural regeneration of) lost or degraded riparian zones may prove essential for the survival of cold water fish such as salmon (which have keystone functions in river ecosystems, such as nutrient return from sea to land) in areas their range is threatened by climate change. (See, as an example, Scotland hopes to save wild salmon by planting millions of trees next to rivers).

[137] Zhang et al (2010). A review of vegetated buffers and a meta-analysis of their mitigation efficacy in reducing nonpoint source pollution. J. Environ. Qual. 39:76–84. With variability depending on factors including the area of land receiving pollutants that drain through the particular riparian buffer zone (which underlines an additional value to having regular npHBLF such as hedges and tree lines, in the landscape) – see Prosser *et al*., 2020: A review of the effectiveness of vegetated buffers to mitigate pesticide and nutrient transport into surface waters from agricultural areas. J Environ Mgt.

[138] See Fennessy, M. & Cronk, J. (1997). The Effectiveness and Restoration Potential of Riparian Ecotones for the Management of Nonpoint Source Pollution, Particularly Nitrate. *Critical Reviews in Environmental Science and Technology,* 27(4):285-317 (1997). This appears particularly true for the removal of N and P. See Zhang et al (2010). A review of vegetated buffers and a meta-analysis of their mitigation efficacy in reducing nonpoint source pollution. J. Environ. Qual. 39:76–84.

	woody vegetation that is also efficient at reducing sediment, N, P. and pesticide pollution. However, where natural vegetation structure tends towards grasses or shrubs, such riparian buffers also provide valuable habitat and mitigation of pollution. Large rivers on average receive water from a larger catchment area and more tributaries and can accumulate high levels of pollution. Small water bodies are also vulnerable, and to small amounts of pollution that have a high relative impact. 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. They are also likely to be exceptionally vulnerable to climate change impacts and to local land management changes, all of which riparian buffers help to moderate.[139] Different widths of riparian buffer zones are suggested in relation to the size of the water body, in recognition of practicality and different riparian habitat needs from ditch verges to gallery forests. **Ditches** Farm drainage ditches are, analogous to hedges, important for biodiversity connectivity in agricultural landscapes.[140] **5 m** buffer zones are stipulated for ditches to retain their valuable habitat function, and to substantially reduce pollution. Though 5m is not adequate to remove all pollution, approx. 50-60% for N and P, for instance[141], it is difficult to require more extensive buffer zones for ditches which may be numerous. Should the operator wish to meet npHBLF requirements by extending these buffer zones further, that could be a beneficial and

[139] Kristensen, P. and Globevnik, L. (2014). European small water bodies. Biology and Environment.

[140] Herzon, I., Helenius, J. (2008). Agricultural drainage ditches, their biological importance and functioning. Biological Conservation: (141)

[141] Zhang et al (2010). A review of vegetated buffers and a meta-analysis of their mitigation efficacy in reducing nonpoint source pollution. J. Environ. Qual. 39:76–84.

	efficient possibility. For example, Natural England[142] recommend 6m buffers for ditches). 5m is also pragmatic as the minimum required for 'bank stabilisation' and thus erosion control and maintenance of aquatic conditions.[143] **Rivers, streams, ponds & lakes etc less than 15m wide** Whereas buffers of ditches may be relatively narrow and still host key vegetation such as reedbeds, riparian verges of larger water bodies need to be wider to host their characteristic vegetation communities and dependent fauna. The 10m stipulation is in line with, for instance, the Brazil Forest Code (2012) for water bodies of this width. In Denmark, all open streams and lakes larger than 100m^2 must have 10m buffers, having had insufficient results on pollution mitigation at lower widths.[144] The stipulation of medium sized water bodies having 10m buffers is on the low end of the desirable width with respects to vegetation structure, but operators may choose to implement wider buffers at their discretion. 10m is not excessive, and often not enough. For instance, one study[145] found buffers of 12m to provide inadequate protection from nutrient pollution, though generally the benefits will be notable (often above 70% removal of P, N, sediment and pesticide[146]). "For low to moderate slopes, most filtering occurs within the first 10 m, but greater widths are necessary for steeper slopes…or

[142] Natural England (2011). Technical Information Note TIN100: Protecting water from agricultural run-off: buffer strips https://www.riverneneregionalpark.org/reference/brochures-downloads/nene-and-welland-support-for-farmer-action-nwsfa-downloads/protecting-water-from-agricultural-run-off-buffer-strips.pdf

[143] Hawes, E. & Smith, M. (2005). Riparian buffer zones: functions and recommended widths. Yale School of Forestry & Environmental Sciences.

[144] Müncha, et al (2016). Towards multifunctionality of rural natural environments? —An economic valuation of the extended buffer zones along Danish rivers, streams and lakes. Land Use Policy.

[145] Aguiar T, R. Jr., Rasera, K., Parron, L.M., Brito, A.G., Ferreira, M.T. (2015). Nutrient removal effectiveness by riparian buffer zones in rural temperate watersheds: The impact of no-till crops practices. Agricultural Water Management (149).

[146] Zhang et al (2010). A review of vegetated buffers and a meta-analysis of their mitigation efficacy in reducing nonpoint source pollution. J. Environ. Qual. 39:76–84.

	where NPS [nitrogen/phosphorus/sediment] loads are particularly high"[147]. **15m + water bodies** The 30m stipulation is again at the low end of the desirable width of riparian zones, from a biodiversity and ecosystem services (B&ES) point of view, and whilst a significant contribution to B&ES, there are likely to be significant gains in circumstances where an operator wishes to expand the buffer width further. For instance, many birds are riparian obligates – requiring quality riparian habitat (such as, in the USA, the southwestern willow flycatcher, swallow-tailed kite and Bell's virio). Numerous studies show species of birds, also including forest-interior species, being excluded from riparian zones of greater size than the 30m stipulation herein. Studies show exclusions of species at various buffer widths from 40m even as wide as 175m (which one study found sufficient to retain 95% of bird species).[148] However, the 30m stipulation is line with the minimum requirement of the Brazil Forest Code (2012), requiring a width of between 30m and 100m – to be half the width of the water body. One study[149] points to the higher efficiency of woody vegetation zones of 36 m and 60 m widths, finding 36m as generally effective to reduce nitrate levels below water protection legislation and regulatory standards. Another study[150] recommends 32.5 m buffer zones in any situation where surround land slopes more than 15%. Another study[151] found riparian zones (in this case, of native grassland) were essential of "more than 30m to either side of the river" to retain characteristic riparian fauna and flora.

[147] Hawes, E. & Smith, M. (2005). Riparian buffer zones: functions and recommended widths. Yale School of Forestry & Environmental Sciences.

[148] For a summary of various studies, see US Corps of Engineers (2000) - Width of riparian zones for birds. https://www.arlis.org/docs/vol1/EMRRP/946618517.pdf

[149] Aguiar T, R. Jr., Rasera, K., Parron, L.M., Brito, A.G., Ferreira, M.T. (2015). Nutrient removal effectiveness by riparian buffer zones in rural temperate watersheds: The impact of no-till crops practices. Agricultural Water Management (149).

[150] Hawes, E. & Smith, M. (2005). Riparian buffer zones: functions and recommended widths. Yale School of Forestry & Environmental Sciences.

[151] Samways & Pryke (2016). Large-scale ecological networks do work in an ecologically complex biodiversity hotspot. Ambio.

3. Grazing regime^	
3.1 Grazing intensity **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 livestock units (LU) per ha** averaged over the holding. Where the designated conservation authority sets lower grazing density guidelines for the maintenance of good status of the semi-natural habitat (for instance as defined in the EU Habitats Directive), these must be adhered to **For other grazing land (e.g., improved pasture) the limit is 1.5 LU/ha** (unless the designated conservation authority stipulates higher stocking densities as appropriate for the local habitat).	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[152] [153] as well as nutrient loss. Appropriate stocking densities of natural and semi-natural grasslands depend on the ecosystem. Examples include: · 0.15 LU/ha - Semiarrid steppe, Mongolia.[154] · 0.3 LU/Ha - German chalk heath.[155] · 0.5 LU/ha - German salt marsh.[156] · 0.6 LU/ha - Upland grassland on basalt.[157] · 0.6 LU/ha - Argentinian subtropical grassland.[158]

[152] IUCN (2011). Supporting Sustainable Pastoral Livelihoods: A Global Perspective on Minimum Standards and Good Practices. Second Edition March 2012: published for review and consultation through global learning fora. Nairobi, Kenya: IUCN ESARO office. vi + 34pp.

[153] Plant Production and Protection Series No. 34. Grasslands of the World. Edited by J.M. Suttie, S.G. Reynolds and C. Batello. Food and Agriculture Organization of the United Nations. Rome. 2005

[154] Li, W., Zhan, S., Lan, Z. *et al.* Scale-dependent patterns and mechanisms of grazing-induced biodiversity loss: evidence from a field manipulation experiment in semiarid steppe. *Landscape Ecol* **30,** 1751–1765 (2015).

[155] Bunzel-Drüke et al. (2019). Naturnahe Beweidung und NATURA 2000: Ganzjahresbeweidung im Management von Lebensraumtypen und Arten im europäischen Schutzgebietssystem NATURA 2000. Near-natural grazing and NATURA 2000: year-round grazing in the management of habitat types and species in the European nature reserve system NATURA 2000. 2nd Edition.

[156] Bunzel-Drüke et al. (2019). Naturnahe Beweidung und NATURA 2000: Ganzjahresbeweidung im Management von Lebensraumtypen und Arten im europäischen Schutzgebietssystem NATURA 2000. Near-natural grazing and NATURA 2000: year-round grazing in the management of habitat types and species in the European nature reserve system NATURA 2000. 2nd Edition.

[157] Dumont, B., Farruggia, A., Garel, J.-P., Bachelard, P., Boitier, E. and Frain, M. (2009), How does grazing intensity influence the diversity of plants and insects in a species-rich upland grassland on basalt soils?. Grass and Forage Science, 64: 92-105.

[158] Pizzio, R., Herrero-Jáuregui, C., Pizzio, M. and Oesterheld, M. (2016), Impact of stocking rate on species diversity and composition of a subtropical grassland in Argentina. Appl Veg Sci, 19: 454-461.

	· 0.7 LU/ha - Slovenian dry sub-Med grassland & late mown karst floodplains.[159] The given limit of 0.7 LU/Ha is a maximum grazing pressure for semi-natural pastures but will not be sufficient to safeguard biodiversity under many circumstances. Therefore, the activity should adhere to lower densities where the competent authority sets them.
3.2 Grazing methods: Biodiversity favourable grazing methods deployed (be it continual, rotational, or mob grazing) within sustainable intensity.	
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: • **No ploughing** unless a convincing conservation rationale is presented in an official conservation plan – e.g., mimicking natural disturbance livestock cannot fulfil – such as wild boar foraging, etc • **No use of fire** unless in fire adapted biomes where beneficial impact on biodiversity can be proved. Any prescribed burning 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	

[159] Šumrada, T., et al (2021). Do the EU's Common agricultural policy funds negatively affect the diversity of farmland birds? Evidence from Slovenia, Agriculture, Ecosystems & Environment, Volume 306.

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.	
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 and control of invasive alien species (IAS) **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 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.	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 management of the introduction and spread of invasive alien species.

Management measures should avoid any adverse impact on the environment.**4.4.3.1 Biocides (i.e., pesticides and plant protection products) are only used under exceptional circumstances to tackle IAS,** and in any case follow Integrated Pest Management principles in line with EC Regulation 1107/2009. "Candidates for substitution' are not used. • Actions to eradicate or manage invasive alien species (IAS) need to be undertaken in accordance with EU and national restrictions on pesticide use, and where applicable the National Action Plan on the sustainable use of pesticides and national codes of practice. • Actions to control IAS with biocides should only be taken if the overall benefit to biodiversity is expected to be positive. Rapid eradication measures should be proportionate to the impact on the environment, that non-lethal methods should be considered and used preferentially, and any action taken should minimise the impact on non-targeted species. The ultimate objective is to protect native species, if eradication measures would undermine this, they should not be taken.[160] **Permission from the competent authority is required:** a. For the use of biocides in Natura 2000 sites or other protected biodiversity areas if there is reason to think such locations could be affected b. If there is reason to believe a priority conservation species could be affected either inside or outside a protected area - as listed in IUCN national red list, Habitats and Birds Directives or equivalents beyond Europe. c. If the biocide is to be used near a freshwater body (i.e., within the riparian buffer zones described in Table 3, 2.2)	

[160] The above two bullet points are adapted from EC (2020), which itself quotes Articles 17 and 18 in the IAS Regulation (**Regulation** (EU) 1143/2014 on **invasive alien species)**.

EC (2020 – Scalera *et al.*). FAQs on how the Invasive Alien Species Regulation interacts with the EU Nature Directives. European Commission, Brussels.

Key definitions: *'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.*	
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 oil-palm based feeds, selected feeds demonstrably comply with Table 3, 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)** Rearing systems for herbivores are to be based primarily on maximum use of grazing pasturage according to the availability of pastures in the different periods of the year.	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 agricultural land being used solely to grow animal 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[163] – and this is only one circular economy stream that could be deployed with livestock.

[163] FAO (Gustavsson, J., 2011). Global food losses and food waste: extent, causes and prevention. Food and Agriculture Organization of the United Nations.

Unless extreme circumstances necessitate time-limited emergency measures (e.g., due to local drought): • The majority (at least 70%) of annual feed requirement (dry mass of) is grazed or cut from grasslands either within the holding or as brought-in herbage (such as hay / haylage / silage), or grazed during periods of transhumance if applicable; • At least 50% of annual feed shall come from the holding itself, conforming to stocking densities herein; • The remainder of pasture-based herbage (i.e., 20%) can be produced in cooperation with other farms primarily in the same region. Any remaining percentage of feed, i.e., of non-pasture-based herbage, should prioritise agroecology outputs (e.g., catch crops, cover crops, forage cut from living trees and shrubs) or circular economy by-products (see below) • A maximum of 15% total feed (dry mass of) can be from other sources, which must comply with the "all livestock" criteria **For non-herbivores (e.g., poultry, pigs, etc)** • At least 70% of the annual feed requirement comes from within the holding, agroecological outputs (e.g., catch crops, cover crops, forage harvested from living trees or shrubs) or circular economy by-products. Brought-in feed is primarily from the same region.	These requirements complement existing requirements for farmers in the EU to have traceability on feed. Regulation (EC) No 183/2005 states:" The traceability of feed and feed ingredients throughout the feed chain is an essential element in ensuring feed safety. Regulation (EC) No 178/2002 contains rules to ensure the traceability of feed and feed ingredients and provides a procedure for the adoption of implementing rules applicable to specific sectors." 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[164] causing loss and degradation of habitat. This continues – in the tropics, most new agricultural lands are at the expense of forests.[165] 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[166] This is addressed through safeguards on importing feeds and encouraging on-site and circular economy feed sources. **Excessive ecological footprint of feed crops** One third of global cereal production is currently fed to livestock.[167] 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

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

[165] 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)).

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

167 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)).

***Note on agroecology outputs**. This means outputs from agroecological production systems[161], particularly outputs which do not derive from an exclusive year-round use of land solely for feeding animals. For example: forage harvested from living trees and shrubs[162] may be multifunctional as both fodder, wind-break, nitrogen fixation, organic matter production and native habitat provision; catch crops can be grown in seasons between other crops – such as root forage or green cover crops grown during winter between summer crop cycles; intercrops may be grown between rows of a main crop.* ***Note on circular economy by-products:** By-products result from the production, use phase, or after-use pathway of another product, and in a circular economy all by-products are used for another application or are returned safely to the biosphere. By-products used in feed should emphasise the redirection of resources which would otherwise become waste, the feed component of which should not be the principal economic driver. For instance, sugar beet pulp and brewer's grains are by-products of brewing and sugar production, however soy cake is not considered a by-product because it is often the principal reason a soy crop is grown and therefore a direct land-take for animal feed. Former foodstuffs, where ingredients intended for human consumption fail quality standards, may also be utilised.*	times less land take) be used to feed people.[168] 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.[169] This issue is addressed through only permitting genuine fishery wastes for livestock feed. **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

[161] See: European Commission Capacity4Dev Team (2020). Supporting the transformation of agricultural and food systems through agroecological approaches. Programme: deSIRA (Development of Smart Innovation through Research in Agriculture). https://europa.eu/capacity4dev/desira/wiki/agroecology-and-sustainable-intensification-including-agroforestry

[162] This refers to the repeated utilisation of forage from perennial trees and shrubs through pollarding, coppicing and trimming, such that the plants are not felled but continue to live. Where the trees and shrubs utilised for cut-forage are native species, they may be part of the holding's biodiversity rich farmed area allocation. This has been a common practice around the world under different names, from "tree hay" to "tree-cut forage" to "tree intercropping" and "alley cropping" (in which the foliage may either be fed to livestock or used to fertilise cropping soils), and so on. A few of myriad examples include in Europe, poplars and willows pollarded or coppiced for feed; in Africa, acacias such as Acacia/Faidherbia albida in savannah parkland grazing systems; in central America, Laecaena fodder trees. See Hawken, P. (2017) Drawdown (Ch: Tree Intercropping, pp.58-59). Penguin Books. Toesnmeier, E. (2016), The Carbon Farming Solution. Chelsea Green. Ch7, pp.90-98. Van Wyk & Van Wyk (2013 ed) Field Guide to Trees of Southern Africa (p.596).

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

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

	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.

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

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[170] and is now adopted by the UNECE Executive Body for the Convention on Long-range Transboundary Air Pollution[171],
- The HELCOM[172] document *Revised Palette of measures for reducing phosphorus and nitrogen losses from agriculture[173],*

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

[171] 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

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

[173] 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

- Best Available Techniques (BAT) Reference Document for the Intensive Rearing of Poultry or Pigs.[174]

Criteria	Rationale
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. 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	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.[176]

[174] 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

[176] 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

• 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[175]) 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[177]	Significant N losses may occur during storage of manures (slurries, farmyard 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[178].

[175] 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

[177] 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 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

[178] 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

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 agricultural holding on which the activity is undertaken:

- Incorporates large areas that are under high-biodiversity landscape features or are otherwise biodiversity rich (Option A) AND ensures alignment in respect of a number of aspects common to Options A, B and C; *OR*
- Abstains from the use of synthetic plant protection products and copper that harm biodiversity and ecosystems (Option B) AND ensures alignment in respect of a number of aspects common to Options A, B and C; *OR*
- Ensures a sustainable farm gate nitrogen balance (Option C) 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.

An agricultural or farm holding ('the holding') is a single unit, both technically and economically, that has a single management and undertakes agricultural activities classified under the NACE codes listed above, either as its primary or secondary activities. [179,180]

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

- Satisfy **all** criteria described in Table 1 AND Table 3; OR

[179] This definition is taken from REGULATION (EU) 2018/ 1091 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL - of 18 July 2018 - on integrated farm statistics and repealing Regulations (EC) No 1166 / 2008 and (EU) No 1337 / 2011 (europa.eu) and was adopted by Eurostat https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Agricultural_holding. It is also used within the framework of the farm accountancy data network under the Common Agriculture Policy. The significant variations between the definition for Regulation and Eurostat and this formulation are 1) the removal of the clause ' within the territory of the Union' as the Taxonomy and these criteria are intended to be interoperable globally, 2) a more precise alignment of the scope of agricultural activities with the NACE codes in the scope of this criteria.

[180] Additional guidance on interpreting this definition is as follows:

- In general, a single unit both technically and economically is indicated by a common use of labour and means of production (machinery, buildings or land, etc.)
- There can be single management even though this is carried out by two or more persons acting jointly
- Where agricultural holdings utilise agricultural area (or livestock) in different regions; the holding is treated as one unit as long as it remains a single unit both technically and economically (common use of the means of production) and operates under single management
- Holdings that for tax or other reasons are split up among two or more persons, but still have a single management (one common manager) and are therefore considered to be one economic unit (single holding)
- Two or more separate holdings, each having previously been an independent holding, that have been integrated into the hands of a single holder, are considered to be a single holding if they now have a common manager or if they use the same labour and equipment (single management and technical and economic unity)
- Agricultural holdings of research institutes, sanatoria and convalescent homes, religious communities, schools and prisons and agricultural holdings which form part of industrial enterprises are included
- Common land consisting of pasture, horticultural or other utilised agricultural area, provided that such utilised agricultural area is operated as an agricultural holding by the local authority concerned (e.g., by the taking in of another persons' cattle to graze as in "taking of animals into assignment") is included
- Common land units (a virtual entity created for the purposes of data collection and recording, consisting of the utilised agricultural area used by agricultural holdings but not belonging directly to them) are included
- "Single-product group-holdings" if they are independent of the "parent" holdings and they mainly use their own factors of production and do not rely mainly on the factors of production of the "parent" holdings are deemed as a holding in their own right
- Migrating herds, which do not belong to holdings using agricultural areas (independent holdings) are included

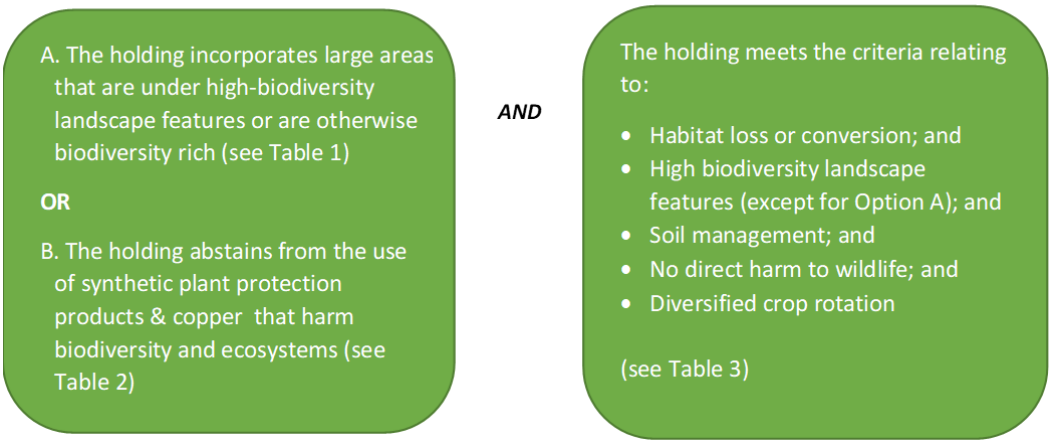
Taken from Eurostat guidance: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Agricultural_holding

- Satisfy **all** criteria described in Table 2 AND Table 3.

This is illustrated in Figure 1.

Option C is currently in development so criteria are not presented here. Further information on this option is given in the 'Rationale' section below.

Figure 1: Conditions under which the activity is compliant



Demonstrating compliance: A spatial and temporal Farm Sustainability Management Plan (FSMP) sets out the 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.

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. In terms of the timing and frequency of verification, where disclosure relates to a specific investment, verification is undertaken at the beginning of the investment period and every three years thereafter. Where assessment is required under the Non-Financial Reporting Directive (NFRD) or CSRD undertakings (Art. 8

TR), verification is undertaken at the time of the first disclosure or compliance with the criteria and every three years thereafter.

In order to reduce costs, verification of compliance with these criteria may be performed together with any other audit or certification. If a particular criterion is already covered by an existing scheme or Regulation that requires verification by an independent third party or nationally competent authority, derogation of verification to that scheme or Regulation is permitted for that particular criterion.

Group verification is permitted for groups of holdings where the maximum distance between the nearest individual plots of land of the participating holdings is 10km. For clarification, each participating holding must meet the criteria specified below in their own right. This provision is simply aimed at reducing administrative burdens and costs.

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[181], are not converted 6. 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.

[181] 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.

(2) Climate change adaptation	DNSH as set out in Appendix 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 Appendix 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. Where the permit specifies conditions to avoid significant impact on water bodies, these are followed. 2. If the holding is located in a WEI+[182] river basin area 20% or above (or equivalent), no other water abstraction than water harvesting is considered[183]. Additionally, any rainwater harvesting system[184] must be authorised by the relevant authority, specifying conditions to avoid significant impact on water bodies. 3. When using an irrigation system: (1) input water source comes from the same river basin; (2) sources as rainwater harvesting systems

[182] https://ec.europa.eu/eurostat/web/products-datasets/-/sdg_06_60 The Water Exploitation Index plus (WEI+) is a measure of total fresh water use as a percentage of the renewable freshwater resources (groundwater and surface water) at a given time and place. It quantifies how much water is abstracted and how much water is returned after use to the environment. The difference between water abstraction and return is regarded as water use and illustrates the pressure on renewable freshwater resources due to water demand. In the absence of Europe-wide agreed formal targets, values above 20% are generally considered as an indication of water scarcity, while values equal or bigger than 40% indicate situations of severe water scarcity, i.e. the use of freshwater resources is clearly unsustainable. The indicator is presented as annual average values. Annual calculations at national level, however, cannot reflect uneven spatial and seasonal distribution of resources and may therefore mask water scarcity that occurs on a seasonal or regional basis. The indicator is a result of estimations by EEA based on data from the WISE SoE - Water quantity database (WISE 3) and other open sources (JRC, Eurostat, OECD, FAO) and including gap filling methods

[183] Water Framework Directive (2000/60/EC) establishes co-ordinated objectives for the good status for all waters. It considers that there is only a certain amount of recharge into a groundwater each year, and of this recharge, some is needed to support connected ecosystems (whether they be surface water bodies, or terrestrial systems such as wetlands). For good management, only that portion of the overall recharge not needed by the ecology can be abstracted - this is the sustainable resource, and the Directive limits abstraction to that quantity. This criterion contributes to comply with the Water Frame Directive requirement regarding the quantitative status of groundwater and surface waters at farm management level

[184] Rainwater harvesting system: on-site rainwater collection for the use of a variety of applications, particularly irrigation and/or drinking of livestock

	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. 4. No modification of water bodies, e.g., straitening of rivers, lining ditches, removal of riparian vegetation, etc. except for no-significant water harvesting systems that have received permit from relevant authority. 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 1. The amount of livestock manure applied to the holding each year, including by any 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.[185] AND The use of plant protection products follows best practice to avoid increases in adverse pressures and avoid substantial harm or continually reduce it to "acceptable/not harmful" level to environmental and human health. This means: 1. Only plant protection products that are authorized under the EU Pesticides database are used.[186] Full compliance with national level PPP regulations is observed. The principles of the Integrated Plant Production Directive 2009/128/EC (sustainable use of pesticides, or 'SUD directive') and future revisions thereof are 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 in Annex III. This means implementing Annex III principles to the effect that sustainable biological, physical and other non-chemical methods must be preferred to chemical methods if they provide satisfactory pest control; pest monitoring should occur and application of PPPs only undertaken if thresholds are exceeded, high-drift techniques such as aerial spraying and booms over 3m are not used and applications are not made during periods where peak pollution events are likely (such as high wind or rain), no spraying is undertaken in areas designated for biodiversity or in aquatic buffer zones, etc. In European Union countries, the relevant SUD National Action Plan is adhered to.

[185] 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).

[186] https://ec.europa.eu/food/plant/pesticides/eu-pesticides-database/active-substances/?event=search.as

	2. Farm records are kept on annual usage quantity of PPPs in total, per category of PPP, per specific product, and per crop type (by land area of). 3. No increases in quantities of PPPs used (either in total, or per crop type per unit area) compared to an annual baseline average determined over a rolling 5 year baseline period (unless due to exceptional circumstances of pest outbreak in which case such anomaly years must not be consecutive or occur more than twice in a 10 year period). If 5 years of data is not available, the baseline average is to be determined using as near to a 5 year average as on-farm data permits.[187, 188] 4. A reputable on-farm pesticide risk assessment tool is used to inform choices of PPPs that help minimise ecological harm. The utilised tool is as appropriate as possible to the PPP types, crops, and location, such as the Pesticides Yardstick[189] (Netherlands), SYNOPS[190] (Germany), and Environmental Impact Quotient[191] and the Multi-Attribute Toxicity Factor[192] (both USA). Advisory notes generated by the tools are adhered to (such as where drift control measures should be deployed, or usage avoided in groundwater

[187] When farm-scale pesticide load index tools become feasible, this measure on no increases in quantities used, could be altered to no increases in pesticide ecotoxicological risk, using an appropriate tool. However, at the time of writing, specialists in adapting, for instance, the Danish Pesticide Load Index to different national and farm scale contexts, advise it is not yet available for generic application.

[188] The use of PPPs needs to be "in line with existing global, national, regional or local plans for pollution reduction", according to EC 2021 (Commission Notice: Technical guidance on the application of 'do no significant harm' under the Recovery and Resilience Facility Regulation (2021/C 58/01)). Given EU policies to reduce PPP usage by 50% by 2030, the implication is generally for substantial reductions in PPP usage, but as noted herein, itis not possible for the criteria to give a hard stipulation on this because the total volumes, and ecotoxicological risks, will vary by place / crop / activity, so a blanket rule is difficult to apply until regional IPM data is available or farm-scale pesticide load indexes are more developed, or direct soil testing for PPP and metabolite residues is viable.

[189] https://www.pesticideyardstick.eu/_The PesticideYardstick is free to individual users.

[190] Strassemeyer et al.,2017. SYNOPS-WEB, an online tool for environmental risk assessment to evaluate pesticide strategies on field level. Crop Protection: 97. SYNOPS is free to use.

[191] The Environmental Impact Quotient [Kovach, J., Petzoldt, C., Degni, J., and Tette, J. 1992. A Method to Measure the Environmental Impact of Pesticides. New York's Food and Life Sciences Bulletin 139:1–8.

See also: Grant, J. A. https://nysipm.cornell.edu/eiq/calculator-field-use-eiq/ Calculator for Field Use EIQ (Environmental Impact Quotient). New York State Integrated Pest Management Program, Cornell Cooperative Extension, Cornell University. 2010-2020.

[192] Benbrook et al. (2002). Developing a Pesticide Risk Assessment Tool to Monitor Progress in Reducing Reliance on High-Risk Pesticides. Amer J. of Potato Res: 79.

	protection areas). It has to be demonstrated that the environmental risks are low or reducing over time significantly. 5. When PPPs are deployed, data is recorded in an applications log explaining the choice of PPPs, dose (quantity and area applied to), and why PPPs are deployed instead of other IPM measures. 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 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. 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[193]. 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

[193] EIP-AGRI Focus Group Mixed farming systems: livestock/cash crops FINAL REPORT MAY 2017

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 crops and 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

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[194];
- The clearing or fragmentation of natural or semi-natural vegetation due to land take for crop production, reducing habitats and biome connectivity[195];
- The removal or mismanagement of biodiversity valuable landscape elements leading to the reduction of habitats and their connectivity;
- Loss and degradation of permanent grassland[196] 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.[197]
- Soil degradation and erosion leading to loss of soil biodiversity and ecosystem services through alteration of soil structure and processes by physical or chemical means such as

[194] ETC/ICM Report 2/2016 European assessment of eutrophication abatement measures across land-based sources, inland, coastal and marine waters. 21 Dec 2016. Prepared by Ralf Ibisch, Katja Westphal, Dietrich Borchardt, Josselin Rouillard, Evelyn Lukat, Benjamin Boteler, Anne Lyche Solheim, Kari Austnes, Wera Leujak, Ursula Schmedtje.

[195] Millennium Ecosystem Assessment, 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.

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

[197] 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.

removal of native vegetation, tillage, application of agrochemicals and fertiliser, stubble burning, prolonged exposure of bare soils etc;[198]

- Other farm management practices that harm biodiversity – e.g., fencing that disrupts wildlife movements, wildlife persecution, use of invasive species etc.

A substantial contribution

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:

- 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/ OR
- 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[199]:

- 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.

They are also consistent with the Farm to Fork[200] 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.

[198] Graaf, M.-A., *et al.* (2019). Effects of agricultural intensification on soil biodiversity and implications for ecosystem functioning: a meta-analysis. Advances in Agronomy. Tsiafouli, M. A. *et al.,* 2014. Intensive agriculture reduces soil biodiversity across Europe. Global Change Biology. Wall, D. H., *et al.,* (2014). Soil biodiversity and human health. Nature: 528.

[199] COM/2020/38 https://eurlex.europa.eu/legalcontent/EN/TXT/?qid=1590574123338&uri=CELEX:52020DC0380

[200] f2f_action-plan_2020_strategy-info_en.pdf (europa.eu)

It is noted however that Option B is the only option in the Crop Production criteria which ensures the ambition level of reductions in PPPs required to meet the EU policy goal of a 50% reduction by 2030. But going organic is only one way to contribute to this goal. In order to reverse adverse impacts on ecological food webs it will also be incumbent on all farming to minimise use of biocides.

In this iteration of the criteria, however, it was not workable to stipulate reductions in PPP use for Option A, not because of a lack of intent[201], but because requiring a reduction of PPP use based on an initial baseline level would, perversely, penalise those farmers or farming areas using low levels to begin with. Consideration was given to stipulating that all crop production must at least meet regionally determined Integrated Pest Management averages per PPP and crop type – but the current reality is this data is generally not available. Further thought was given to requiring farmers to demonstrate low or reduced levels of risk to the environment through use of PPPs, through risk assessment approaches such as the Danish Pesticide Load Index. However, experts in the field advise that such approaches are not yet workable at farm scale, though may soon be. Consideration was also given to whether on-farm soil testing would permit the impacts of PPPs to be directly determine, and criteria be set ensuring environmental quality standards are not exceeded. Again, the lack of feasible on-farm testing and need for laboratory analyses, made this unworkable at this time.

Due to these constraints, the Do No Significant Harm criteria on Pollution Prevention and Control, are limited to not permitting increased usage of PPPs by volume[202,] and adopting IPM approaches - including the use of an on-farm PPP planning tool to help select the least damaging product and dosage when alternatives to PPPs are not considered viable. In future iterations of the

[201] Depending on the context, research frequently shows substantial reductions in PPP usage is possible without adversely affecting yields or profit. For example: Lechenet *et al.* (2017) show a reduction of 42% PPPs without consequence on yields in 59% of French farms examined; Jacquet *et al.* (2011), also in France, concluded it would be possible to reduce pesticide use by 30% nationally without reducing farmers' incomes; and in a review of IPM projects in Asia and Africa, Pretty & Bharucha (2015) found that in 30% of IPM crop combinations, pesticide use drops to zero, and that in most agroecosystems, "at least 50% of pesticide use is not needed". See: Lechenet, M. et al. (2017). Reducing pesticide use while preserving crop productivity and profitability on arable farms. Nature Plants (3). Jacquet, F. *et al.* (2011). An economic analysis of the possibility of reducing pesticides in French field crops. Ecological Economics (70). Lechenet, M. *et al.* (2017). Reducing pesticide use while preserving crop productivity and profitability on arable farms. Nature Plants (3). Pretty, J.., Bharucha, Z. P. (2015). Integrated Pest Management for Sustainable Intensification of Agriculture in Asia and Africa. Insects (6).

[202] This was considered necessary as simply iterating the need to adopt EU standards on Integrated Pest Management would not, under current details of the regulations, actually guarantee no increases in use and environmental exposure.

criteria, it is to be hoped that regional IPM data, and/or feasible soil testing, may be available to enable stronger contributions to EU policy on this environmental objective. For the time being, the criteria include Option B as a direct route to progressing this objective, and it is to be hoped all operators adopting IPM will also make significant progress.

Option A: Large areas of the 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%[203] 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.

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[204]. Active regeneration of landscape connectivity is needed to restore landscape heterogeneity and bend the curve for biodiversity. Restoring features such as field margins, hedges, grass strips, native trees and 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[205].

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

[204] Nel J.., *et al.* (2020). Spatial assessment of the impacts of pressures on biodiversity in the EU. Wageningen University & Research. Implementing Framework Service contract No. EEA/NSS/17/002/LOT 1

[205] Garibaldi, *et al.* (2020). Working landscapes need at least 20% native habitat. Conservation Letters.

Option B: The holding abstains from the use of synthetic plant protection products and copper that harm biodiversity and ecosystems

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 2.

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.

A note on work in progress Option C: The holding ensures 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.[206] 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. Such impacts affect not only local ecosystems in the region where nitrogen is emitted, but also regions very far away through air transmitted ammonia and also through water-bound nitrogen traveling by rivers into seas, leading there to eutrophication.

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

Many EU Directives aim to tackle excess nutrients and their consequences. The EU Nitrates Directive[207] aims to reduce water pollution by nitrates from agricultural sources and prevent pollution of ground and surface waters. The EU Water Framework Directive[208] aims at protecting and restoring the quality of all inland and coastal waters across Europe, and the National Emissions Ceilings (NEC) Directive[209] 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.[210]

For the EU-Commission the reduction of nutrients losses is one of the major goals of the EU Biodiversity Strategy to 2030. With it, it aims to reduce nutrient losses by at least 50%, while reducing the use of fertilisers by at least 20% by 2030.

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

In August 2021, criteria for ensuring a sustainable farm-gate nitrogen balance were put forward for public consultation.[211] This approach was based on farm-gate surplus-limits (N-input - N-output) giving the farmers the possibility to choose the necessary and targeted N-reduction measures on their farms. Additionally, the approach differentiated surplus limits according to type of fertilizer (manure or mineral) and prevalent manure on the farm, defining overall surplus limits to ensure a sustainable livestock-area-balance. These tailored limits are needed to incentivize the better use of organic manure, after which mineral fertilizer and thus the overall amount of nitrogen entering the nitrogen cycle can be reduced.

[207] Council Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources (the Nitrates Directive)

[208] Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy" or, for short, the EU Water Framework Directive (WFD)

[209] National Emissions reduction Commitments (NEC) Directive (2016/2284/EU) EUR-Lex - 32016L2284 - EN - EUR-Lex (europa.eu)

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

[211] For details see: Platform on sustainable finance: technical working group (2021): Part B – Annex: Full list of technical screening criteria: Call for feedback by the Platform on Sustainable Finance on preliminary recommendations for technical screening criteria for the EU taxonomy | European Commission (europa.eu)

The feedback that the proposal received, generally supported the sustainable farm-gate-balance approach as a promising way to reduce agricultural nitrogen but criticised the absence of regionally differentiated surplus limits, for 1. not complying with EU-legislation (especially with the European Court of Justice's ruling on case C-543/16 (21 June 2018)) and 2. not taking into account how nutrient flows may be affected by regional differences such as soil, climate or slope. As a result, work is ongoing to develop regionally differentiated surplus limits. These would take account of 1) the capacity of different ecosystems in buffering nitrogen pollution, 2) the differing pollution impact of nitrogen which varies depending on soil, slope and climate, and 3) the locally varying N pollution from other sectors which affects the "allowable" N losses from agriculture. The framework for this is described below and fully detailed criteria will follow. The inclusion of Option C alongside Options A and B will greatly assist in providing opportunities for all agricultural holdings, including landless farms, to comply with the EU Taxonomy.

A regionalisation approach for the nitrogen-farm-gate-balance will be proposed that is based on a geographically highly resolved data set of critical nitrogen surpluses. In a recent study, DeVries et al.[212] modelled regionally explicit critical N surpluses which depend on the one hand on environmental thresholds for air and water (either derived from EU-legislation or from values derived from scientific literature) and on the other hand on the regional specifics determining the regional impact of nitrogen. The authors were with this able to calculate critical N surpluses for ca. 40,000 Nitrogen Calculation Units (NCUs), which are clusters of 1 km × 1 km pixels with identical soil type, slope class and altitude class within a NUTS3 region.

For the determination of the local and taxonomy-relevant farm-specific surplus limits, these values can be used directly, but an adaptation is suggested as 1) The uncertainty for the results on the lowest calculation level of 1 kmx1 km is high and 2) global/EU-data sets on soil, slope and climate can never reach the accuracy of the data that the farmers have locally at hand. The proposed approach for assessing specific farm surplus limit is therefore the integration of an algorithm in a virtual tool that uses on the one hand local and verified data on soil, climate, slope

[212] Wim de Vries, Lena Schulte-Uebbing, Hans Kros, Jan Cees Voogd, Geertrui Louwagie, Spatially explicit boundaries for agricultural nitrogen inputs in the European Union to meet air and water quality targets, Science of The Total Environment, Volume 786, 2021, 147283, ISSN 0048-9697, https://doi.org/10.1016/j.scitotenv.2021.147283.

of the cropping land provided by the farmer and on the other hand the relevant data from DeVries et al. (2021) on regional thresholds to calculate farm-specific and concrete surplus limits.[213]

DeVries et al. (2021) cover only the EU. But a paper with a global data set from the same authors is now under review and will be published soon.[214]

The critical N-surpluses will take into account critical ammonia emissions in view of nutrient enrichment of terrestrial ecosystems (biodiversity effects) and critical N concentration in surface waters to avoid eutrophication (biodiversity effects). They will not take into account Critical nitrate/nitrogen leaching to groundwater as we are targeting biodiversity where groundwater is not usually relevant. The final relevant regionalised critical surplus limit will be the minimum of a. and b. as we want to make sure that neither water nor air pollution leads to adverse ecological impacts. This will then be combined with local farm-specific data on prevalent manure on the farm and farming system (cropping, mixed farming …) to derive the final, localised surplus limit.

A note for further application: Option C is being 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 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 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.

[213] Communication with the authors made clear that the data will be made available and that such an algorithm is possible.

[214] A first publication on the global data set can be found here: https://research.wur.nl/en/publications/managing-nitrogen-to-keep-food-production-within-environmental-li. Schulte-Uebbing, L. F. (2021). Managing nitrogen to keep food production within environmental limits. Wageningen University. https://doi.org/10.18174/544138

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.

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 and reference to local circumstances and authorities as appropriate, 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 element of the criteria is given in Tables 1, 2 and 3.

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[215], 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. Work is in train to 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: Large areas of the holding are under high-biodiversity landscape features or are otherwise biodiversity rich

1. Creation and maintenance of biodiversity rich farmland	
Key definitions for these criteria: Category A: Non-productive High Biodiversity Landscape Features (npHBLF):	These criteria provide routes to compliance both for farms that demonstrate high intrinsic levels of biodiversity due to the biodiverse farmed area itself (typically more extensive farming systems[223]), as well as to more intensive farming that contributes sufficient non-productive high

[215] 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].

[223] See EC (2018), Farming for Natura 2000. Also, Halada *et al.* (2011).

Land lying fallow[216], hedges, trees and shrubs (isolated / in line / in groups / wooded strips[217]), field margins, riparian verges, ponds, traditional stone walls, traditional terrace walls, flower strips[218]). They are features primarily for habitat, biodiversity and ecosystems services: if a yield is taken, it is incidental and a by-product to the management of the habitat (e.g., hay cut from fallows). Category B: Biodiverse farmed area Biodiversity rich agroecosystems based on native plant species[219] that are farmed for a productive yield. Specifically: • Agroforestry with native permanent ground, shrub, or canopy layer of documented high biodiversity value (which may include mature orchards, nut groves, montado/dehesa, barrocal, extensive olive groves, etc • Other agroecosystems, such as rice paddies under biodiversity-friendly management, where a convincing conservation rationale is presented (e.g., presence of priority species)	biodiversity landscape features (npHBLF) or participation in official conservation schemes. [224] The criteria combine aspects of both land-sharing and land-sparing approaches to biodiversity conservation. Firstly, safeguards are presented (see Table 3) to ensure agriculture does not destroy or convert high value non-agricultural habitats (i.e., essential land sparing, because many species do not thrive in agriculture). However, because the most biodiverse agroecosystems are by definition land-sharing, these extensive farming systems are recognised herein. **Biodiversity rich farmland** **Natural and semi-natural habitats** The biodiversity rich farmland categories defined opposite will include any natural or semi-natural on-farm habitats. Natural habitats are natural ecosystems hardly altered by human activities – any remainder of which must be conserved (see Table 3). 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

[216] Fallows may be rotational or non-rotational. In pastures, fallows may include pasture that is uncut or grazed for at least a year (which we add to the list - see next footnote - because the CAP list was designed for arable, and we also need to ensure sward variation in grazed ecosystems (see rationale column). Such longer sward may be in isolation or in combination with (i.e. as a buffer) around other landscape features such as trees.

[217] Deadwood from native trees, should be left in-tact (standing or on the tree) or on the ground under the tree canopy (unless there are compelling reasons to remove, such as disease that could affect living trees).

[218] The vegetation component of these all to be native species (i.e. dominant components of trees, hedges, riparian verges). This list is based on types of areas and landscape features that qualify for Ecological Focus Areas in the CAP (see Delegated Regulation (EU) 639/2014, Section 4).

[219] A native, or "indigenous" (syn) species, is one "occurring within its natural range (past or present) and dispersal potential (i.e. within the range it occupies naturally or could occupy without direct or indirect introduction or care by humans)" (IUCN 2000. Guidelines for the Prevention of Biodiversity Loss Caused by Alien Invasive Species (2000). Approved by the IUCN Council, Feb 2000. Cited on the Convention of Biological Diversity's Glossary: https://www.cbd.int/invasive/terms.shtml visited Januray 2022).

[224] See Grass et al. (2019). Land-sharing/sparing connectivity landscapes for ecosystem services and biodiversity conservation. People & Nature.

• Biodiverse permanent grassland[220] and biodiverse non-grassland semi-natural habitat used for grazing[221] Category C: Land managed for threatened and endangered species or habitats under an official conservation scheme Land managed under a specific conservation scheme, designed or formally endorsed by	being natural, these habitats and ecosystems often have high value in terms of biodiversity and the services they provide[225] Low intensity, “extensive” agricultural management creates and maintains semi-natural habitats – with a diverse fauna and flora. Until the early 20th century, all European farmland was essentially what is now called high

[220] Biodiverse permanent grassland: These are composed of perennial or self-seeding native annual forage species which may persist indefinitely, may be natural (such as savannah, steppe, pampas, prairie) or semi-natural (such as alpine meadows, dehesa, hay meadows) and can include agro-silvo-pastural systems of high biodiversity such as dehesa/montado and traditional tall fruit tree orchards with natural vegetation soil cover. These must be unimproved – not tilled for a minimum of 5 uninterrupted years, and not subjected to fertilisation, mulching, re-seeding, or the addition of liming agents, pesticides, herbicides or other substances capable of altering the natural species composition (see Table 3, 1.6).

The definition of “biodiverse permanent grassland” given is based on various consistent definitions. CAP Direct Payments (Reg EU: 1307/2013, Article 4, 1h) defines permanent grassland as **“**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”. “Biodiverse grassland” has been taken to be natural and semi-natural: Leschen et al. (2013) of Wageningen University undertaking work for the EC to define and classify grasslands in Europe) conclude that ecologically valuable grasslands “are semi-natural and natural grasslands that are not agriculturally improved (e.g., through cultivation, reseeding, fertilisation, irrigation and drainage) of long standing and species rich (taking account of all taxa not only higher plants).” See Lesschen, P. et al. (2014). Task 1 - Defining and classifying grasslands in Europe. Alterra – part of Wageningen UR. (This research was implemented in the framework of Grassdate Project (2012/S 87-142068) Methodological studies in the field of Agro-Environmental Indicators Lot 2. Grassland areas, production and use.) RED Dir 2018/2001 also requires the species richness of grasslands to be recognised by a competent authority, but we consider this unnecessary for the purposes of this taxonomy provided grasslands are natural or semi-natural. See Allen *et al.* (2011).). An international terminology for grazing lands and grazing animals. Grass and Forage Science.

These definitions are also consistent with RED Dir 2018/2001, Natureserve (2010 - classifying global grasslands for IUCN), and EEA 2016 & 2020. See EEA (2016). Mapping and assessing the condition of Europe's ecosystems: progress and challenges EEA contribution to the implementation of the EU Biodiversity Strategy to 2020. EEA Report No 3/2016 and EEA (2020). State of Nature in the EU: Results from reporting under the nature directives 2013-2018. EEA Report - No 10/2020. European Environmental Agency.

[221] As defined under ‘Animal Production’ Criteria. Non-grassland habitat such as forest, scrubland and wetlands, may be included when evidence is produced that grazing is necessary to maintain high biodiversity characteristics. Such evidence should be based on and align with guidance by competent conservation authorities and the Farm Sustainability Management Plan should specify the biodiversity objectives pursued (such as control of invasive species, maintenance of a % of herbaceous vegetation, fuel load reduction, grazing plan, etc).

In Europe, if the habitat type is listed in Table 1 of Halada et al. (2011) as partially or completely dependent on grazing activity, this would be permissible provided the grazing intensity stipulations (see Table 4, Animals Production fiche) are adhered to as necessary to avoid overgrazing the specific habitat. However, Halada *et al’s* list is not exhaustive of habitats for which grazing may be beneficial and is limited to Europe.

[225] 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. See Janssen, J. & Rodwell, J. (2017). Red List of European Habitats. These are defined in various ways, the wording quoted is from the . Similarly: IPBES (2019)” An ecosystem with most of its processes and biodiversity intact, though altered by human activity in strength or abundance relative to the natural state”.European Investment Bank. (2018). European Investment Bank, Environmental and Social Standards. Luxembourg. Similarly: IPBES (2019)” IPBES Regional Assessment Report on Biodiversity and Ecosystem Services for Europe and Central Asia. Appendix 6.3 ”An ecosystem with most of its processes and biodiversity intact, though altered by human activity in strength or abundance relative to the natural state”.

competent conservation authorities, for the conservation of species or habitats (e.g., habitats and species of Annex 1 of Habitats Directive, or locally applicable equivalents if not in Europe, and species Red Lists). For examples, see EC 2018[222]. **1.1 The activity satisfies one of the following four options to deliver sufficient coverage of biodiversity rich areas** **OPTION 1: The holding maintains npHBLFs (Category A) on at least 20% of its area.** Specifically: · If the current area of npHBLF is below 20%, then 20% npHBLF is reached within a year (I.e., one annual growing cycle). · If the current area of npHBLF is above 20%, then this % is maintained. That is, existing npHBLF are not destroyed or converted. In addition, each parcel of land within the holding that is more than 5km from any other parcel of land within the holding must meet this requirement within its own area. *Criteria on the management of npHBLF, are in Table 3.* **OR** **OPTION 2: The holding maintains biodiversity rich farmed areas (category B) in good condition, or improves their condition substantially, at least on 30% of its area.** In addition, each parcel of land within the holding that is more than 5km from any other parcel of	nature value farmland[226], and to varying extents in different countries, various biodiverse semi-natural habitats continue to depend on agricultural management[227] Examples of biodiversity rich agroecosystems these criteria are likely to apply to include extensive orchards, olive and almond groves, barrocal[228]; mixed species shea parklands; shade-grown coffee and spice agroforestry, and potentially (if being declared as part of a broader cropping activity), also semi-natural grasslands and agropastoral ecosystems such as cork-oak savannah (dehesa/montado). However, intensification has led to loss of much extensive farmland and with it, species associated with farmland: 76% of habitats and at least 70% of species listed in the Habitat and Birds Directives and associated with agriculture show an unfavourable conservation status; permanent grassland decreased by 6.4% between 1993 and 2011 in the EU and by 11.8% in new member states; between 1990 and 2011, European grassland butterfly populations declined by around 50 % in 19 European Countries; and since 1990 populations of common farmland birds declined by around 30% in 27 European Countries.[229] **Non-productive high biodiversity landscape features (npHBLF)** In addition to biodiverse farmed area (i.e., that is both biodiverse *and* productive), it is also important to retain the *non-productive* high biodiversity landscape features (npHBLF), for which a direct yield may not be taken at all (and if so, would be incidental) – such as hedgerows, trees, scrub and farm ponds - the loss of which

[222] EC (2018), Farming for Natura 2000.

[226] IPBES (2019). IPBES Regional Assessment Report on Biodiversity and Ecosystem Services for Europe and Central Asia. Appendix 6.3.

[227] Halada et al. (2011). Which Habitats of European Importance Depend on Agricultural Practices? Biodiversity and Conservation and EC (2018), Farming for Natura 2000.

[228] In Europe, many such biodiverse farmed areas are included in the described High Nature Value farming systems. See Halada et al. (2011). Which Habitats of European Importance Depend on Agricultural Practices? Biodiversity and Conservation and EC (2018), Farming for Natura 2000.

[229] European Commission (2014), Pe'er et al. (2014) & EEA (2013), cited by *IPBES, 2019: Regional Assessment Report on Biodiversity and Ecosystem Services Appendix 6.3 for Europe and Central Asia*

land within the holding must meet this requirement within its own area. **OR** **OPTION 3: The holding maintains a combination of npHBLF and biodiverse farmed areas (categories A and B) in good condition on at least 30 % of its area (or reaches 30% within one year if the baseline is < 30%)** In addition, each parcel of land within the holding that is more than 5km from any other parcel of land within the holding must meet this requirement within its own area. **OR** **OPTION 4: At least 30% of the holding is under an official conservation scheme as recognised by national authorities for priority species or habitats (Category C)** In addition, each parcel of land within the holding that is more than 5km from any other parcel of land within the holding must meet this requirement within its own area. The FSMP sets out, with regular monitoring: • Ongoing and time-specific conservation targets • Evidence of successful compliance with conservation targets **1.2 The maximum continuous area lacking biodiversity rich farmland categories (per categories A, B, C above) must not be more than 3 Ha**	further exacerbates habitat loss and fragmentation in the farmed landscape[230]. 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 non-rotational fallow land, hedges, non-productive trees, terrace walls, and ponds." npHBLF offers corridors and stepping-stones interconnecting wild populations across landscapes that might otherwise form barriers[231] [232]. npHBLFs are crucial nesting sites for farm birds, many of which forage in the cropping areas (see below). Reptiles and smaller mammals are also significantly affected by the fragmentation caused by the removal of small landscape features, and habitat heterogeneity is crucial to rural biodiversity[233]. In addition to providing habitat, npHBLF provide a wide range of broader ecosystem services from carbon sequestration to aquifer recharge. Such ecosystem services are not only valuable to biodiversity and society as a whole, but also to agriculture. The EU Biodiversity Strategy includes the target that 'uptake of agroecological practices is to be significantly increased'. npHBLF are central to agroecological design, providing functions such as nitrogen fixation, soil building and erosion control, wind breaks, shading, pest

[230] Benton et al. (2021). Food system impacts on biodiversity loss: 3 levers for food system transformation in support of nature. Chatham House.

[231] Garibaldi, *et al.* (2020). Working landscapes need at least 20% native habitat. Conservation Letters.

[232] Zanden, E. & Verburg, P., Sander, M. (2013). Modelling the spatial distribution of linear landscape elements in Europe. Ecological Indicators. 27. 125–136. 10.1016/j.ecolind.2012.12.002.

[233] Benton, T.G., Vickery, J.A. & Wilson, J.D. 2003. Farmland biodiversity: is habitat heterogeneity the key? Trends Ecol. Evol. 18: 182–188.

However, such limit can be surpassed (for example in strip cropping) as long as maximum width of an area lacking biodiverse features does not exceed 100m.	management, pollination[234] improved rain absorption, etc[235] [236]. Fallow land (one of the types of npHBLF) provides space for biodiversity and co-benefits to soil productivity, soil health, nutrient balance, pest and disease control. For example, the decline of farmland birds in Spain is strongly associated with the loss of fallow land (in terms of fields left fallow on rotation)237. Fallows are important for a number of ground-nesting birds and some threatened birds of dry cereal steppe land. Margins (a type of field-edge fallows that may include flower strips, bird-seed strips, grass strips, etc) also have a range of associated fauna, often beneficial crop pollinators and pest predators. They are important for ensuring populations of farmland birds at landscape scale as well as wider functions such as buffering pollutant dispersion and reducing soil erosion.[238] **Selecting area thresholds for high biodiversity landscape categories** Many studies show significant critical thresholds of habitat on farms between 10-14% for a range

[234] "The presence of hedgerows and semi-natural elements in cropland is fundamental for enhancing pollination. According to (Schulp, Lautenbach, & Verburg, 2014) green linear elements, covering only 0.5% of agricultural area, increase the probability of visitation of crops by pollinators by 15/20%" (IPBES, 2019: IPBES Regional Assessment Report on Biodiversity and Ecosystem Services Appendix 6.3 for Europe and Central Asia).

[235] Holland, J.M., Douma, J.C., Crowley, L. et al. Semi-natural habitats support biological control, pollination and soil conservation in Europe. A review. Agron. Sustain. Dev. 37, 31 (2017). https://doi.org/10.1007/s13593-017-0434-x

[236] Garibaldi, *et al.* (2020). Working landscapes need at least 20% native habitat. Conservation Letters.

[237] Traba and Morales (2019). The decline of farmland birds in Spain is strongly associated to the loss of fallow land. Scientific reports (9).

[238] Marshall & Moonen (2002). Field margins in northern Europe: their functions and interactions with agriculture. Agriculture, Ecosystems and Environment 89 (2002) 5–21.

	of species and taxa[239] [240], such as: birds[241] [242] [243], hares[244] and pollinating and other insects[245] [246]. Sometimes more habitat is required for farmland species (20-40%)[247]. One study calls 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"248. 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%'[249]. Though situations vary, such levels of npHBLF can be retained or restored without detriment to working landscape productivity250, and in many cases may provide increases in productive

[239] Oppermann et al. (2020) Sicherung der Biodiveristät in der Agrarlandschaft, Institut für Agrarökologie und Biodiversität (IFAB). Mannheim, 191 Seiten. ISBN 978-3-00-066368-0ER

[240] BIOGEA (2020). A green architecture for green infrastructure: how the future CAP could support green and blue infrastructures. (BIOGEA = Testing BIOdiversity Gain of European Agriculture with CAP greening). https://www.adelphi.de/en/publication/green-architecture-green-infrastructure

[241] Traba and Morales (2019). The decline of farmland birds in Spain is strongly associated to the loss of fallowland. Scientific reports: 9.

[242] Walker, L.K., Morris, A.J., Cristinacce, A., Dadam, D., Grice, P.V. and Peach, W.J. (2018), Effects of higher-tier agri-environment scheme on the abundance of priority farmland birds. *Anim Conserv*, 21: 183-192. https://doi.org/10.1111/acv.12386

[243] Mechtry-Stier *et al.(*2014). Impact of landscape improvement by agri-environment scheme options on densities of characteristic farmland bird species and brown hare (Lepus europaeus). Agriculture, Ecosystems & Environment 189, 101-109 (https://doi.org/10.1016/j.agee.2014.02.038)

[244] Aebischer, Nicholas & Ewald, Julie. (2004). Managing the UK Grey Partridge Perdix perdix recovery: Population change, reproduction, habitat and shooting. Ibis. 146. 181 - 191. 10.1111/j.1474-919X.2004.00345.x.

245 Humbert et al. (2010). Wiesen Ernteprozesse und ihre Wirkung auf die FAuna Herausgeber: Forschungsanstalt Agroscope Reckenholz-Tänikon ART Tänikon, CH-8356 Ettenhausen,Redaktion: Etel Keller, AR (http://www.stiftungnatur.at/content/4-downloads/1273589655_humber_j_y_art_bericht_724_d.pdf).

[246] Pfister et al. (2020) in Oppermann et al. (2020) Sicherung der Biodiveristät in der Agrarlandschaft. Institut für Agrarökologie und Biodiversität (IFAB)

[247] Oppermann et al. (2020) Sicherung der Biodiveristät in der Agrarlandschaft, Institut für Agrarökologie und Biodiversität (IFAB). Mannheim, 191 Seiten. ISBN 978-3-00-066368-0ER

[248] Garibaldi, *et al.* (2020). Working landscapes need at least 20% native habitat. Conservation Letters.

[249] Allen, B. & Hiller, N. (2020). Determining substantial contribution to biodiversity: ensuring agriculture delivers for biodiversity through the EU Sustainable Finance Taxonomy. IEEP policy report October 2020.

[250] Garibaldi, *et al.* (2020). Working landscapes need at least 20% native habitat. Conservation Letters.

	yields[251] [252]. Commonly, "the area we can devote to native habitats without losing production ranges from 13% to 27%"[253]. **Spatial allocation of biodiversity rich farmland categories** To ensure the general ecological functionality of farmland, it is important to reach viable percentages of biodiversity rich farmland, but its spatial distribution is also important to ensure populations do not collapse due to habitat fragmentation. **Field size[254]** is also a very important indicator of biodiversity[255] [256], interacting with npHBLF to increase biodiversity more than either factor without the other. For instance, presence of npHBLF alongside small fields increases the likelihood that species can make foraging use of fields whilst nesting / roosting in adjacent HBLFs, and these effects are consistent across taxa, regions, and both rare and common species[257] [258]. The more heterogeneous the farming landscape, the better for biodiversity as the further species have to move to feed, the more energy they expend and the less successful their breeding is likely to be[259]. *"small field sizes are of utter importance to half and maybe even reverse the decline in biodiversity in landscapes dominated by annual*

[251] Pywell, *et al.* (2015). Wildlife friendly farming increases crop yield: evidence for ecological intensification. Royal Society. https://doi.org/10.1098/rspb.2015.1740

[252] Dainese, M. et al. 2019. A global synthesis reveals biodiversity-mediated benefits for crop production. Science Advances (5). DOI: 10.1126/sciadv.aax0121

[253] Garibaldi, *et al.* (2020). Working landscapes need at least 20% native habitat. Conservation Letters.

[254] The academic literature often uses the term "field size" in a generic sense of cropped / grazed area, regardless of type or mix of crops or livestock, legalities of land ownership, how the area is bordered (e.g., with semi-permanent npHBLF such as hedges or with annual flower strips or other).

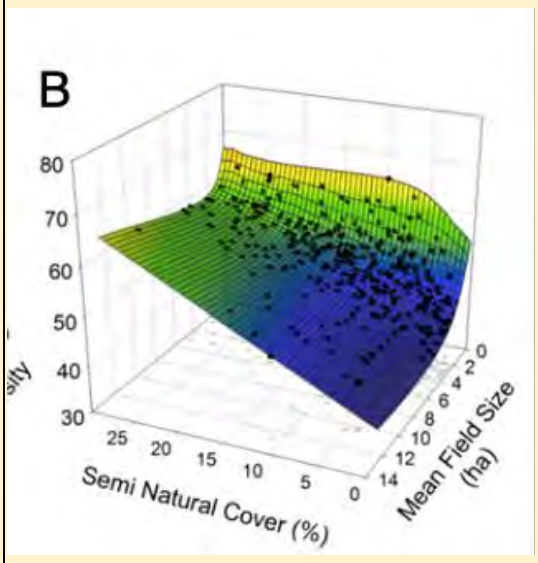
[255] Fahrig et al (2015). Farmlands with smaller crop fields have higher within-field biodiversity. Agriculture, Ecosystems and Environment: 200.

[256] Martin et al. (2019). Effects of farmland heterogeneity on biodiversity are similar to – or even large than – the effects of farming practices. Agriculture, Ecosystems and Environment: 288.

[257] Clough et al (2019). Field sizes and the future of farmland biodiversity in European landscapes. Conservation Letters: 13.

[258] Sirami et al (2019). Increasing crop heterogeneity enhances multitrophic diversity across agricultural regions. PNAS: 116.

[259] Schifferli (2001). Birds breeding in a changing farmland. Acta Ornithologica: 36; 1.

	crops". However, generally, "field sizes are still increasing"[260]*.* Farms complying with the taxonomy primarily through provision of habitat (Option A, this table) need to ensure biodiversity functionality at a smaller spatial resolution than other options for compliance (see Table 3), because many farmland species have to meet their needs within small distances. The effect of reducing field size from 5 to 2.8 Ha, for instance, can be as strong as the effect of increasing npHBLF from 0.5 to 11%261. The smaller the field size, the better: between 0.25 Ha (50m^2) and 2.8 Ha (167m^2), much diversity is already likely to have been lost, though less so with more inclusion of HBLF (see figure, below). The effect of field size on biodiversity is greatest in the range of 0.25Ha to 3Ha (i.e., Option A) – beyond which a clear threshold of biodiversity loss is crossed[262]. 

[260] Clough et al (2019). Field sizes and the future of farmland biodiversity in European landscapes. Conservation Letters: 13.

[261] Sirami et al (2019). Increasing crop heterogeneity enhances multitrophic diversity across agricultural regions. PNAS: 116. They considered 7 taxa from producers to predators in 435 landscapes in 8 regions - in France, Germany, Spain, UK and Canada.

[262] Clough et al (2019). Field sizes and the future of farmland biodiversity in European landscapes. Conservation Letters: 13.

	Figure. Relationship of field size and multi-taxa biodiversity index (y axis). Source: Sirami et al., 2019[263]. **The "either, or" option** allows farmers to maintain efficiencies through potentially very long strip cropping, if they wish to have larger areas unbroken by npHBLF[264]. Although 100m is beyond the range of some farm species, those should at least be able to forage from adjacent npHBLF into the centre of the field (albeit with less overlapping of foraging ranges from multiple npHBLFs on different field margins, which would be optimum). The measure of maximum width without npHBLF improves the chances of the entire land area making a contribution to functional biodiversity, even in very large cropping areas. The most vulnerable species are those with low dispersal distances, such as pollinators, orthopterans and grassland forbs, which are often an important food base for farmland birds. Important grassland forbs such as yellow rattle, orchids, helleborines, etc, often have very short dispersal distances, often less than a metre (e.g., 3 species of orchids[265]). Orthopterans such as bush crickets react very badly even to small scale fragmentation, requiring gaps between habitat of no larger than 10m266. Small

[263] Sirami et al (2019). Increasing crop heterogeneity enhances multitrophic diversity across agricultural regions. PNAS: 116.

[264] See various papers cited by Clough et al (2019). Field sizes and the future of farmland biodiversity in European landscapes. Conservation Letters: 13.

[265] Jersáková, J. and Malinová, T. (2007), Spatial aspects of seed dispersal and seedling recruitment in orchids. New Phytologist, 176: 237-241. https://doi.org/10.1111/j.1469-8137.2007.02223.x

[266] Braschler B., Marini L., Thommen G.H., Baur B. (2009): Effects of small-scale grassland fragmentation and frequent mowing on population density and species diversity of orthopterans: a long-term study. Ecological Entomology 34: 321–329.

	bees react on scales of 100-300m[267] [268] [269] [270] [271]. Many farm birds have very limited foraging ranges from nest-sites. Results from studies include: Skylarks, female – 54m[272]; Red-backed shrike – 57m, averaging only 26m when rearing young; Yellow-hammer – 82m; Goldfinch – less than 100m; corn bunting (whilst breeding), water pipit, hoopoe – all often less than 200m[273] [274]. Small and medium-sized butterflies have strong limitations on their dispersal range: small species such as blues and coppers – 49m; medium species such as skippers, 86m275, and the vast majority of false ringlets disperse less than 100m[276] [277].

Table 2: Criteria for Option B: Abstaining from the use of synthetic plant protection products and copper that harm biodiversity and ecosystems

[267] Benjamin, F.E., Reilly, J.R., Winfree, R. & Osborne, J. (2014). Pollinator body size mediates the scale at which land use drives crop pollination services. J Appl Ecol, 51, 440-449.

[268] Steffan-Dewenter, I., Münzenberg, U., Bürger, C., Thies, C. & Tscharntke, T. (2002). Scale-dependent effects of landscape context on three pollinator guilds. Ecology, 83, 1421–1432.

[269] Jauker F., Diekötter T., Schwarzbach F., Wolters V. (2009): Pollinator dispersal in an agricultural matrix: opposing responses of wild bees and hoverflies to landscape structure and distance from main habitat. Landscape Ecology 24: 547–555.

[270] Zurbuchen A., Landert L., Klaiber J., Müller A., Hein S., Dorn S. (2010): Maximum foraging ranges in solitary bees: only few individuals have the capability to cover long foraging distances. Biological Conservation 143: 669–676.

[271] Zurbuchen A., Landert L., Klaiber J., Müller A., Hein S., Dorn S. (2010): Maximum foraging ranges in solitary bees: only few individuals have the capability to cover long foraging distances. Biological Conservation 143: 669–676.

[272] Jeromin, K. (2002). Zur Ernährungsökologie der Feldlerche (Alauda arvensis L. 1758) in der Reproduktionsphase.

[273] Various papers cited by Schifferli (2001). Birds breeding in a changing farmland. Acta Ornithologica: 36; 1.

[274] Podletnik M., Denac D. (2015): Selection of foraging habitat and diet of the Hoopoe Upupa epops in the mosaic-like cultural landscape of Goričko (NE Slovenia). Acrocephalus 36 (166/167): 109–132.

[275] Sekar & Sandhya (2012): A meta-analysis of the traits affecting dispersal ability in butterflies: can wingspan be used as a proxy? Journal of Animal Ecology, 81, 174–184

[276] Čelik T. (2003): Population structure, migration and conservation of Coenonympha oedippus Fabricius, 1787 (Lepidoptera: Satyridae) in a fragmented landscape. PhD Thesis. University of Ljubljana, Biotechnical Faculty

[277] Čelik T., Verovnik R. (2010): Distribution, habitat preferences and population ecology of the False Ringlet Coenonympha oedippus (Fabricius, 1787) (Lepidoptera: Nymphalidae) in Slovenia. Oedippus 26: 7-15

Criteria	Rationale
1. Limitation of the use of plant protection products	
1.1 Organic production: **EITHER** **The holding is certified as organic** under the EU-organic standard on production and labelling[278] or comparable standards outside of the EU aligned with the regulation[279]. **OR** **The holding only uses organics-compatible plant protection products** that are authorised under Article 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[280] (OJ L 150,	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[281]. 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 biological control of pests, farmscaping[282]), thus, contributing to pest control in crops[283][284]. Pollinators and pollination are also increased in organic systems[285][286]. Organic soil management practices are highly favourable to belowground, detritivore and aboveground arthropods, including natural enemies of pests[287]. Organic farming has also positive impacts on the overall biodiversity at landscape scale[288]. If

[278] 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)

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

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

[281] Sandhu, Harpinder, Stephen D. Wratten and Ross Cullen. 2010. Organic agriculture and ecosystem services. Environmental Science & Policy 13 (2010): 1-7.

[282] Smukler, Sean & Sánchez-Moreno, Sara & Fonte, Steven & Ferris, Howard & Klonsky, Karen & geen, A & Scow, Kate & Steenwerth, Kerri & Jackson, Louise. (2010). Biodiversity and multiple ecosystem functions in an

[283] Douglas A. Landis, Stephen D. Wratten, and Geoff M. Gurr. 2000. Habitat Management to Conserve Natural Enemies of Arthropod Pests in Agriculture. Annual Review of Entomology

[284] 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

[285] Gabriel, Doreen and Teja Tscharntke. “Insect pollinated plants benefit from organic farming.” Agriculture, Ecosystems & Environment 118 (2007): 43-48

[286] Rundlöf, Maj & Smith, Henrik & Birkhofer, Klaus. (2016). Effects of Organic Farming on Biodiversity. 10.1002/9780470015902.a0026342.

[287] Birkhofer K, Bezemer TM, Bloem J, Bonkowski M, Christensen S, Dubois D, Ekelund F, Fließbach A, Gunst L, Hedlund K, Mäder P, Mikola J, Robin C, Setälä H, Tatin-Froux F, Van der Putten WH, Scheu S (2008) Long-term organic farming fosters below- and aboveground biota: Implications for soil quality, biological control and productivity. Soil Biology and Biochemistry 40: 2297-2308

[288] 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.

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.	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[289] [290] [291] *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.[292] • Organic farming restored both richness and abundance, including a variety of (dis)service-providing organisms.[293] • Overall organic farming enhances total microbial abundance and activity in agricultural soils at a global scale.[294] • Organic farming promotes diverse arthropod metacommunities that may provide temporal and spatial stability of ecosystem service provisioning.[295] • Organic crops certainly increase the taxonomic richness and abundance of insects as well as the richness of insects within trophic guilds

Dicks, S.O. Petrovan & R.K. Smith (eds) What Works in Conservation 2020. Open Book Publishers, Cambridge, UK.

[289] 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

[290] *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*

[291] *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*

[292] 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. Landscape context affects the sustainability of organic farming systems. Proc Natl Acad Sci U S A. 11;117(6):2870-2878. doi: 10.1073/pnas.1906909117.

[293] Katayama, N; Bouam, I; Koshida, C; Baba, YG. 2019. Biodiversity and yield under different land-use types in orchard/vineyard landscapes: A meta-analysis. Biological Conservation [Internet]. 2019;229 :125-133.

[294] Lori, M; Symnaczik, S; Mader, P; De Deyn, G; Gattinger, A. 2017. Organic farming enhances soil microbial abundance and activity—A meta-analysis and meta-regression. PLoS ONE 12(7): e0180442. https://doi.org/10.1371/journal.

[295] Lichtenberg, E. M., Kennedy, C. M., Kremen, C., Batáry, P., Berendse, F., Bommarco, R., Bosque-Pérez, N. A., Carvalheiro, L. G., Snyder, W. E., Williams, N. M., Winfree, R., Klatt, B. K., Åström, S., Benjamin, F., Brittain, C., Chaplin-Kramer, R., Clough, Y., Danforth, B., Diekötter, T., ... Crowder, D. W. (2017). A global synthesis of the effects of diversified farming systems on arthropod diversity within fields and across agricultural landscapes. Global Change Biology. https://doi.org/10.1111/gcb.13714

	(herbivores, predators, pollinators and parasitoids). Thus, the belief that organic agriculture contributes to the conservation of biodiversity is supported by the analyses 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.[296] • 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.[297] • 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.[298] *Pesticides have a negative impact on biodiversity* Many papers show that insect mass and species have declined over the last decades. Although there are several reasons for the decline in insects, the papers

[296] Montañez, María & Amarillo, Angela. (2014). Impact of organic crops on the diversity of insects: A review of recent research. Revista colombiana de entomología. 40. 131.

[297] J.C., Barbottin A., Durant D., Tichit M., Makowski D. (2014) Farmland Birds and Arable Farming, a Meta-Analysis. In: Lichtfouse E. (eds) Sustainable Agriculture Reviews. Sustainable Agriculture Reviews, vol 13. Springer, Cham. https://doi.org/10.1007/978-3-319-00915-5_3

[298] Crowder, David W., Tobin D. Northfield, Richard Gomulkiewicz, William E. Snyder, and J. T. Cronin. 2012. "Conserving and Promoting Evenness: Organic Farming and Fire-Based Wildland Management as Case Studies." Ecology 93 (9): 2001–7. doi:10.1890/12-0110.1.

	show that intensification of agriculture and the use of pesticides is one of them. [299] [300] [301] [302] 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.[303] [304] 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[305] [306] [307]. 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[308] [309].
1.2 The maximum application rate of plant protection products containing copper	Copper is particularly used in organic agriculture and most importantly in horticulture and potatoes

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

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

[301] Adam J Vanbergen. 2013. Threats to an ecosystem service: pressures on pollinators. Frontiers in Ecology and the EnvironmentVolume 11, Issue 5

[302] 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

[303] Malaj Egina, von der Ohe Peter C., Grote Matthias, Kühne Ralph, Mondy Cédric P., Usseglio-Polatera Philippe, Brack Werner, Schäfer Ralf B. 2014. Organic chemicals jeopardize the health of freshwater ecosystems on the continental scale. Proceedings of the National Academy of Sciences, 111 (26), https://doi.org/10.1073/pnas.1321082111

[304] EEA, 2018d, 'WISE Water Framework Directive (data viewer)', European Environment Agency (https://www.eea.europa.eu/data-and-maps/dashboards/wise-wfd)

[305] Liess, M., Foit, K., Knillmann, S., Schäfer, R.B. & Liess, H.-D. (2016) Predicting the synergy of multiple stress effects. Scientific Reports, 6, 32965.

[306] Leo Posthuma, Scott D. Dyer, Dick de Zwart, Katherine Kapo, Christopher M. Holmes, G. Allen Burton, Eco-epidemiology of aquatic ecosystems: Separating chemicals from multiple stressors, Science of The Total Environment, Volume 573, 2016, Pages 1303-1319, ISSN 0048-9697, https://doi.org/10.1016/j.scitotenv.2016.06.242.

[307] EEA, SOER, 2020: European Environment Agency, 2019. The European environment state and outlook 2020. Knowledge for transition to a sustainable Europe. Luxembourg: Publications Office of the European Union, 2019

[308] Leo Posthuma, Scott D. Dyer, Dick de Zwart, Katherine Kapo, Christopher M. Holmes, G. Allen Burton, Eco-epidemiology of aquatic ecosystems: Separating chemicals from multiple stressors, Science of The Total Environment, Volume 573, 2016, Pages 1303-1319, ISSN 0048-9697, https://doi.org/10.1016/j.scitotenv.2016.06.242.

[309] EEA, SOER, 2020: European Environment Agency, 2019. The European environment state and outlook 2020. Knowledge for transition to a sustainable Europe. Luxembourg: Publications Office of the European Union, 2019

compounds is limited to 28 kg/ha of copper over a period of 7 years (i.e., on average 4 kg/ha/year).[310]	production as fungicides and for its antimicrobial properties[311]. However, the use of copper, and notably in its sulphate form, has caused copper (Cu) accumulation in soils and groundwater[312] [313] [314]. 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 the EU.

Table 3: Criteria for Options A and B

Criteria	Rationale
1. Minimising habitat loss, conversion and deterioration^	
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[315] since 2008, or at any future date. **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.	

[310] 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)

[311] 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.

[312] Astrid R. Jacobson, Sylvie Dousset, Nathalie Guichard, Philippe Baveye, Francis Andreux (2005). Diuron mobility through vineyard soils contaminated with copper. Environmental Pollution, Volume 138, Issue 2.

[313] Brunetto G., Bastos de Melo G. W., Terzano R., Del Buono D., Astolfi S., Tomasi N., Pii Y., Mimmo T., Cesco S. (2015). Copper accumulation in vineyard soils: Rhizosphere processes and agronomic practices to limit its toxicity. DOI:10.1007/978-3-319-10969-5_12

[314] Komárek, Michael, Eva Čadková, Vladislav Chrastný, François Bordas and Jean-Claude Bollinger. 2010. "Contamination of vineyard soils with fungicides: a review of environmental and toxicological aspects." Environment international 36 1: 138-151.

[315] 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)

(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. Drainage** **1.3.1. No further drainage of moist farm areas is undertaken, such as springs, flushes, water meadows.** **1.3.2. No increase in drainage efficiency** (meaning the capacity of the drainage system to discharge water volume per unit of time and land) **where there may be potential negative impact on moist habitat**, such as wet pastures or moist areas of fields where soil-probing birds feed. No new underground drains, tile drains nor other measures such as deepening, straightening, concreting, etc. **1.3.3. The point source outputs of existing subsurface drains do not by-pass riparian zones and discharge directly to any natural water bodies** but are routed through an Integrated Buffer Zone or other nature-based solutions prior to discharge to water bodies. The plant component of the nature-based solution must include only native species. **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), the following are observed as explained in Farm Sustainability Management Plan and verified by the relevant conservation authority where applicable:	Increasing drainage efficiency reduces habitat for many species (such as snipe, curlew, lapwing, godwit, ruff, corncrake, spotted crake, etc[320]., and amphibians); increases diffuse pollution to waterways, especially N and P pollution; and increases downstream flooding risks. Drainage activities undertaken in an effort to increase agricultural land area leads to the loss of specialised habitat, and of food supply and breeding sites for species. Wintering birds are particularly affected by ongoing and past drainage activities[321]. Drainage for use as agricultural land has been identified as one of the main pressures for habitats and species. Habitat heterogeneity is crucial in the rural landscape[322]. Integrated buffer zones in dry buffer strips are a valuable modification of dry buffer strips in order to mitigate the adverse impacts of high nutrient loading from agricultural fields on the aquatic environment. They provide additional valuable ecosystem services such as, for instance, flood attenuation by increasing the water storage in agricultural landscapes and by augmenting biodiversity through provision of habitats for amphibians and wetland plants [323]. Various nature-based solutions as nutrient mitigation measures have been implemented as efficient solutions reviewed[324].

[320] For instance, see Newton (2017). Farming and Birds. Harper Collins.

[321] State of nature in the EU. Results from reporting under the nature directives 2013-2018. EEA Report - No 10/2020. European Environmental Agency (2020).

[322] Benton, T.G., Vickery, J.A. & Wilson, J.D. 2003. Farmland biodiversity: is habitat heterogeneity the key? Trends Ecol. Evol. 18: 182–188.

[323] Zak D., Kronvang B., Carstensen M.V., Hoffmann C.C., Kjeldgaard A., Larsen S.E., Audet J., Egemose S., Jorgensen C. A., Feuerbach P., Gertz F. and Jensen H.S. 2018. Nitrogen and Phosphorus Removal from Agricultural Runoff in Integrated Buffer Zones. Environmental Science and Technology. 52 (11), pp. 6508–6517 (2018).

[324] Hoffmann C.C., Zak D., Kronvang B., Kjaergaard C., Carstensen M. V. and Audet J. 2020. An overview of nutrient transport mitigation measures for improvement of water quality in Denmark. Ecological Engineering 155 (2020) 105863.

• 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. • Land conversion and production activities are carried out in accordance with the conclusions of an appropriate assessment[316], where applicable, and necessary mitigation measures[317] have been implemented accordingly[318] **1.5 Semi natural grasslands[319] 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 features and areas of high biodiversity value^	
For the application of the criteria below, see Table 1 above for the definitions of npHBLFs (see category A) and other qualifying areas of high biodiversity value (see categories B-C) **2.1. The holding maintains non-production high biodiversity landscape features (npHBLF) in at least 10% of its farm area.** Specifically: • If the current area of npHBLF is below 10%, then 10% npHBLF is reached within a year.	The inclusion of criteria relating to the creation or enhancement of high-biodiversity landscape features is important as agriculture covers 39% of land area in the EU.[327] The EU Biodiversity Strategy requires at least 10% of agricultural area in the EU to be under

[316] 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.

[317] Those measures have been identified to ensure that the project/pla N/Activity will not have any significant effects on the conservation objectives of the protected area.

[318] 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.

[319] For grassland definitions, see Table 1.

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

• If the current area is above 10%, the higher % is maintained. I.e., Existing HBLFs are not destroyed or converted. In addition, each parcel of land within the holding that is more than 5km from any other parcel of land within the holding must meet this requirement within its own area. *N.B. This criterion will automatically be met by those following Option A.* **2.2. The maximum continuous area lacking biodiversity rich area (per categories A, B and C) must not be more than 5 Ha** However, such limit can be surpassed (for example in strip cultivation) as long as maximum width of a	high-biodiversity landscape features (npHBLF, herein).[328] Many studies converge on 10-14% npHBLFs at farm scale as a minimum to avoid crossing critical thresholds of biodiversity loss[329] [330] [331], such as: birds[332] [333], hares[334] [335] and pollinating and other insects[336] [337]. Further, inclusion of HBLFs can increase crop yields[338]. 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[339]. The share of fallow land in utilised agricultural area (UAA) in the EU27 is 4.1% (Eurostat, 2021), and the estimated UAA covered by landscape features (grass margins, shrub

[328] "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.

[329] Material Economics (2018) "The Circular Economy – A power force for climate mitigation". Link here.

[330] Oppermann et al. (2020) Sicherung der Biodiveristät in der Agrarlandschaft, Institut für Agrarökologie und Biodiversität (IFAB). Mannheim, 191 Seiten. ISBN 978-3-00-066368-0ER

[331] BIOGEA (2020). A green architecture for green infrastructure: how the future CAP could support green and blue infrastructures. (BIOGEA = Testing BIOdiversity Gain of European Agriculture with CAP greening). https://www.adelphi.de/en/publication/green-architecture-green-infrastructure

[332] Aebischer, Nicholas & Ewald, Julie. (2004). Managing the UK Grey Partridge Perdix perdix recovery: Population change, reproduction, habitat and shooting. Ibis. 146. 181 - 191. 10.1111/j.1474-919X.2004.00345.x.

[333] Mechtry-Stier *et al.(*2014). Impact of landscape improvement by agri-environment scheme options on densities of characteristic farmland bird species and brown hare (Lepus europaeus). Agriculture, Ecosystems & Environment 189, 101-109 (https://doi.org/10.1016/j.agee.2014.02.038)

[334] Walker, L.K., Morris, A.J., Cristinacce, A., Dadam, D., Grice, P.V. and Peach, W.J. (2018), Effects of higher-tier agri-environment scheme on the abundance of priority farmland birds. *Anim Conserv*, 21: 183-192. https://doi.org/10.1111/acv.12386

[335] Traba and Morales (2019). The decline of farmland birds in Spain is strongly associated to the loss of fallowland. Scientific reports: 9.

[336] Humbert et al. (2010). Wiesen Ernteprozesse und ihre Wirkung auf die FAuna Herausgeber: Forschungsanstalt Agroscope Reckenholz-Tänikon ART Tänikon, CH-8356 Ettenhausen,Redaktion: Etel Keller, AR (http://www.stiftungnatur.at/content/4-downloads/1273589655_humber_j_y_art_bericht_724_d.pdf).

[337] Pfister et al. (2020) in Oppermann et al. (2020) Sicherung der Biodiveristät in der Agrarlandschaft. Institut für Agrarökologie und Biodiversität (IFAB)

[338] Dainese, M. et al. 2019. A global synthesis reveals biodiversity-mediated benefits for crop production. Science Advances (5). DOI: 10.1126/sciadv.aax0121

[339] Pywell, *et al.* (2015). Wildlife friendly farming increases crop yield: evidence for ecological intensification. Royal Society. https://doi.org/10.1098/rspb.2015.1740

cropping area lacking biodiverse features, does not exceed 100m. **2.3. Management of npHBLFs** **2.3.1. Semi-permanent npHBLF (such as established trees, hedges, ponds) should be maintained and not replaced by more transient features**.[325] **2.3.2. No use of fertiliser, plant protection products or other chemicals within 10m of npHBLF** **2.3.3. No vegetation cutting / grazing / mowing of npHBLFs during sensitive times of year** such as bird breeding and plant flowering & seed development **2.3.4. 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.[326] • Are at least: o For ditches: buffers = 5m wide o For small / medium rivers and standing water bodies (up to 15m wide): buffers = 10m o For large water bodies, above 15m wide:	margins, single trees bushes, lines of trees, hedges and ditches) is approx. 0.5%[340]. npHBLFs are spatial features but their integrity also depends on management, to be described in the Farm Sustainability Management Plan and conforming with Table 3 stipulations. The value of good management of npHBLF is also recognised in the Common Agricultural Policy.[341] 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, npHBLF 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, proportionately and with net biodiversity benefit. **Regarding spatial allocation of biodiversity rich farmland categories** **Regarding 5 Ha.** Whilst Option A is set at a lower threshold of diversity loss (3 Ha), the next threshold beyond which the benefit of smaller field sizes is largely lost, is around 6Ha342, thus 5 Ha retains some benefit prior to this point.

[325] Although the net overall % of area under high biodiversity farmland categories cannot be reduced (see Table 3), this stipulation is to discourage loss of longstanding features and replacing them with annually determined features such as flower strips.

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

[340] Eurostat (2015). LUCAS Land Use and Land Cover Survey. Eurostat Statistics explained, available online at: http://ec.europa.eu/eurostat/statistics-explained/index.php/LUCAS_- _Land_use_and_land_cover_survey

[341] GAEC standards for *good agricultural and environmental condition of land*, cover various of the npHBLF in these criteria. For example, GAEC 9 – prohibits cutting hedges and trees during the bird breeding and nesting season, and suggests measures for avoiding invasive plant species

[342] Sirami et al (2019). Increasing crop heterogeneity enhances multitrophic diversity across agricultural regions. PNAS: 116.

buffers = 30m o The FSMP must describe how HBLFs will be created and managed in line with these criteria. **2.4. Management of high biodiversity areas (per categories A, B and C): Invasive alien species are removed to the extent possible without recourse to chemicals**. **2.5 Record keeping** The types, extent and condition of the respective biodiversity rich farmland categories must be identified, mapped, described and annually updated in the FSMP, according to the stipulations of the relevant option to compliance. Where the biodiversity rich farmland categories occur within a Natura 2000 site or other protected area, the FSMP must include an explanation of how the types and management of biodiversity rich farmland categories are consistent with the Natura 2000 site/protected area's management objectives (as established by the competent conservation authorities if such exist). The FSMP must describe how biodiversity rich farmland areas are being created / managed to ensure these criteria are met.	Another study provides figures of decreases in biodiversity as field size rises to 5.2 Ha[343]. The difference in farmland biodiversity between field sizes of 1 to 6 Ha, is **similar to the difference when moving from 35% to 0% semi-natural habitat cover**[344]. So, whilst ensuring 10% npHBLF, we can limit further losses from large fields and improve synergy between npHBLF and farmed areas by placing an upper limit on npHBLF-free areas. **Example 1:** Options for a 5 ha field of 200m by 250m, include: • Adding a fallow strip of 20m width and 250m length, to meet its 10% npHBLF on-site. • Dividing itself into smaller units than 5ha using npHBLF such as flower strips, hedgerows, fallows, tree lines, or such like, which would contribute towards that land area's npHBLF even if not constituting the full 10% (in which case the remaining HBLF quotient needs to be within 5km – see below). • Distributing its 10% npHBLF on-site through other means that may not be to divide the field, such as scattered native trees, or a field corner allocated to native scrub reverting to woodland, or such like. **Example 2**: A farmer could choose to strip-farm a larger-than-5 Ha area, provided it were no more than 100m wide. If have a 100m wide, 1km long farmed area (10 Ha), there would be 2200m of npHBLF around the margin. The farmer could decide whether to meet all the 10% HBLF onsite or not, and if chooses to do so onsite, it could be achieved by making those field margin npHBLFs 4.54m wide on average (1 Ha). **Example 3:** A very large, farmed area (e.g., 50 Ha), where the farmer does not wish to install semi-permanent field margins such as hedgerows, could simply be interspersed with flower strips every 100m, either to the extent

[343] Fahrig et al (2015). Farmlands with smaller crop fields have higher within-field biodiversity. Agriculture, Ecosystems and Environment: 200.

[344] Many studies cited in Clough et al (2019). Field sizes and the future of farmland biodiversity in European landscapes. Conservation Letters: 13.

	required to meet the 10% HBLF or allowing part of the 10% to be met off-site. **On ways to reduce npHBLF-free areas: from hedgerows to flower-strips.** Expanses of npHBLF-lacking cropping area may be interspersed either by semi-permanent npHBLF such as hedgerows, tree-strips, dry-stone walls, etc, or by more transient npHBLF such as wildflower strips. In this way, the criteria do not assume creation of "fields" with semi-permanent npHBLF borders – although "permanent field edges, especially, act as refuges for many species, including nesting sites and food resources"[345]. However, farmers may instead choose to ensure their npHBLF is met by annual allocation of less permanent npHBLF such as flower strips (see example 3 above). For example, pairs of whitethroat and corn bunting have been shown to increase in proportion to area of wildflower strips[346]. **Regarding spatial limits to land providing biodiverse farmland area** The main objective of these criteria is to ensure crop production that contributes to the conservation of farmland biodiversity. This requires maintaining biodiversity rich farmland categories throughout the farming landscape and considering the geometry of farming systems to enable species to make use of as much land as possible (see above criteria). However, flexibility is given to farmers to decide to meet part of the quotient of biodiversity rich farmland nearby, rather than in, the production area. After having guaranteed protection of existing npHBLFs, riparian zones, and minimum distances between npHBLFs in the productive grazing area, other areas may be found within 5km of the productive land through which to meet the obligations. This might be because of a particularly powerful farming or biodiversity rationale (e.g., if nearby lands are particularly biodiverse but not legally protected and would thus benefit from safeguarding). It needs to be clear in the FSMP how each parcel of land

[345] Clough et al (2019). Field sizes and the future of farmland biodiversity in European landscapes. Conservation Letters: 13.

[346] Jenny et al. (1997). Der ökologische Ausgleich in intensive genutzten Ackerbaugebieten der Champagne genevoise GE und des Klettgaus SH und seine Bedeutung für Vögel, Pflanzen und ausgewählte Wirbellose. Swiss Ornithological Institute, Sempach. Cited in Schifferli (2001). Birds breeding in a changing farmland. Acta Ornithologica: 36; 1.

	being claimed by the activity meets its biodiverse farmland categories either on that parcel or within 5km of it. Geographical limits are needed, however, in order to avoid deferring all measures to locations completely ecologically disconnected to the farmland. By placing this limit within the range of many farmland species, the likelihood is increased of a synergy between the parcel and linked lands: for instance, species might nest in npHBLF a small distance away from the parcel being farmed, but still be able to forage within the productive land of the parcel. Many birds and insects have ranges of less than a couple of hundred meters (see Table 1). Other species operate on scales less than a kilometre, such as parisitoids and syrphid flies - important natural pest control agents and pollinators[347] [348] [349] [350] [351]. A review of the foraging ranges of 61 farm bird species showed only three with a range of as much as 3km, and most ranged 1km or less (see Schifferli, 2001)[352].

[347] Chaplin-Kramer, R., O'Rourke, M.E., Blitzer, E.J. & Kremen, C. (2011). A meta-analysis of crop pest and natural enemy response to landscape complexity. Ecology Letters, 14, 922–932.

[348] Haenke, S., Scheid, B., Schaefer, M., Tscharntke, T. & Thies, C. (2009). Increasing syrphid fly diversity and density in sown flower strips within simple vs. complex landscapes. Journal of Applied Ecology, 46, 1106–1114.

[349] Kleijn, D. & van Langevelde, F. (2006). Interacting effects of landscape context and habitat quality on flower visiting insects in agricultural landscapes. Basic and Applied Ecology, 214–301.

[350] Kruess, A. & Tscharntke, T. (1994). Habitat Fragmentation, Species loss, and Biological Control. Science, 264, 1581-1584

[351] Thies, C., Roschewitz, I., Tscharntke, T. (2005). The landscape context of cereal aphid-parasitoid interactions. Proc. R. Soc. B, 272, 203-210.

[352] Schifferli (2001). Birds breeding in a changing farmland. Acta Ornithologica: 36; 1.

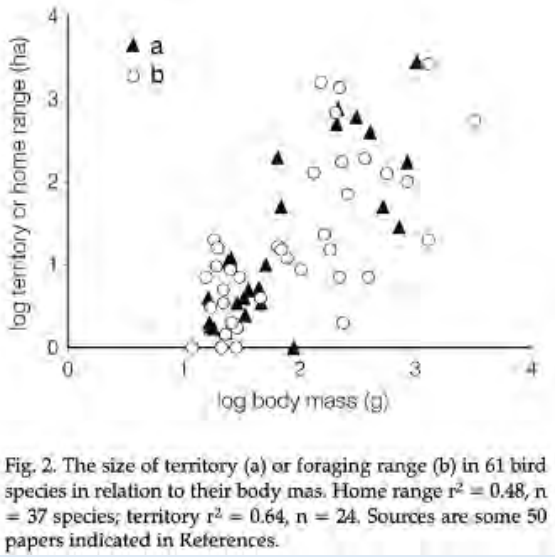


Fig. 2. The size of territory (a) or foraging range (b) in 61 bird species in relation to their body mas. Home range $r^2 = 0.48$, n = 37 species; territory $r^2 = 0.64$, n = 24. Sources are some 50 papers indicated in References.

Figure source: Schifferli (2001)[353]

Non-passerines often have larger ranges than passerines – e.g., barn owls (637m), white storks, 1.3 km; merlin, 1-1.7 km[354]. Scops owls may forage as far as 1.9 km but usually stay within 100-400m, their occurrence decreasing with distance from the nearest hedge[355]. Grey partridge has a core action area of 1 ha, and 2 Ha in breeding season[356] [357] and very few migrate beyond 3km in the autumn[358] [359] [360]. European nightjars have been shown to feed as far as 7km away from their roosting sites, but not by preference due to higher energetic costs and metabolic stress incurred as distances

[353] Schifferli (2001). Birds breeding in a changing farmland. Acta Ornithologica: 36; 1.

[354] Studies cited in Schifferli (2001). Birds breeding in a changing farmland. Acta Ornithologica: 36; 1.

[355] Denac K., Kmecl P., Koce U. (2019): Habitat use of Eurasian Scops Owls Otus scops in an agricultural mosaic landscape. Ardea 107(2): 119-129.

[356] Gottschalk, E.; Beeke, W. (2014): Wie ist der drastische Rückgang des Rebhuhns (Perdix perdix) auf-zuhalten? Erfahrungen aus zehn Jahren mit dem Rebhuhnschutzprojekt im Landkreis Göttingen. In: Berichte zum Vogelschutz Bd 51, S. 95–116.

[357] Laux, D.; Herold, M.; Bernshausen, F.; Hormann, M. (2017): Artenhilfskonzept Rebhuhn (Perdix perdix) in Hessen. Gutachten der Staatlichen Vogelschutzwarte für Hessen, Rheinland-Pfalz und Saarland. Hungen. 86 p.

[358] Glutz von Blotzheim, U. N.; Bauer, K. M.; Bezzel, E. (1998): Handbuch der Vögel Mitteleuropas. Wiesbaden: Aula-Verlag.

[359] Hölzinger, J., (2001) Die Vögel Baden-Württembergs- Gefährdung und Schutz, Teil 2 –Artenschutzprogramm. - Verlag Eugen Ulmer.

[360] Laux, D.; Herold, M.; Bernshausen, F.; Hormann, M. (2017): Artenhilfskonzept Rebhuhn (Perdix perdix) in Hessen. Gutachten der Staatlichen Vogelschutzwarte für Hessen, Rheinland-Pfalz und Saarland. Hungen. 86 p.

	increase: “in degraded, homogenized landscapes, birds generally fly further to find food compared to those in diverse landscapes”[361]. Bee species vary in foraging range from hundreds of meters (small bees) to multiple kilometres. European bumble bees usually forage between 750m and 1500m[362] [363] [364] [365], and honeybees have been shown to fly as far as 12km[366] though flight distance is one of the biggest costs for bees to evaluate and optimal foraging prioritises the closest resources possible[367] [368]. Brown hares live year-round within a few dozen hectares, from 26ha to 190 ha - i.e., up to 1.3 km^2 [369]. We can see from the above that a great many farm species will not be making inter-site connections beyond 5km. However, it is given as the *maximum* distance. This, combined with the requirements on riparian verges, maintaining existing npHBLFs, and on the spatial configuration of on-site npHBLF, make it more likely that most npHBLF contribution will be occurring within this 5km limit.

[361] Evens et al., 2018. Proximity of breeding and foraging areas affects foraging effort of a crepuscular, insectivorous bird. Scientific Reports: *8:3008* | DOI:10.1038/s41598-018-21321-0

[362] Benjamin, F.E., Reilly, J.R., Winfree, R. & Osborne, J. (2014). Pollinator body size mediates the scale at which land use drives crop pollination services. J Appl Ecol, 51, 440-449.

[363] Carvell, C., Jordan, W.C., Bourke, A.F.G., Pickles, R., Redhead, J.W. & Heard, M.S. (2012). Molecular and spatial analyses reveal links between colony-specific foraging distance and landscape-level resource availability in two bumblebee species. Oikos, 121, 734–742.

[364] Steffan-Dewenter, I., Münzenberg, U., Bürger, C., Thies, C. & Tscharntke, T. (2002). Scale-dependent effects of landscape context on three pollinator guilds. Ecology, 83, 1421–1432.

[365] Osborne, J.L., Martin, A.P., Carreck, N.L., Swain, J.L., Knight, M.E., Goulson, D. et al. (2008). Bumblebee flight distances in relation to the forage landscape.

[366] Greenleaf, S.S., Williams, N.M., Winfree, R. & Kremen, C. (2007). Bee foraging ranges and their relationship to body size. Oecologia, 153, 589–596.

[367] Couvillon et al (2015). Honey bee foraging distance depends on month and forage type. Apidologie (2015) 46:61–70.

[368] Henry, M., Fröchen, M., Maillet-Mezeray, J., Breyne, E., Allier, F., Odoux, J.-F. et al. (2012). Spatial autocorrelation in honeybee foraging activity reveals optimal focus scale for predicting agro-environmental scheme efficiency. Ecological Modelling, 225, 103–114.

[369] Olesen, C.R. & Asferg, T. 2006. Assessing potential causes for the population decline of European brown hare in the agricultural landscape of Europe - a review of the current knowledge. National Environmental Research Institute, Denmark. 32 p. NERI Technical report No. 600. http://www.dmu.dk/Pub/FR600.pdf

	On riparian buffer zones Riparian buffer zones provide crucial habitat and wider ecosystem services[370]. They provide valuable habitat in an ecotone featuring species associated with both the aquatic and the adjacent terrestrial land and the unique edge between the two – such as amphibians, kingfishers, water voles, etc). Riparian habitats provide corridors that contribute to habitat connectivity on a landscape level. They help to safeguard the quality of the aquatic systems by which they occur, through mediating factors on which other species depend such as shade, water temperature and input of biomass[371] - which can be particularly important for the resilience of water bodies to global heating.[372] They also contribute to removal of agricultural pollutants that have negative impacts on biodiversity and on human uses for water. The science of riparian zones is detailed, but width is a key factor. On average, riparian buffers of 30m are modelled as 93% effective in removing pesticides from water entering freshwater bodies. Efficacy of sediment, N, P and pesticide removal decreases with smaller buffer zone width, notably declining below 10m[373] Buffer zones are often more effective at pollution removal when composed of woody vegetation (particularly trees).[374] By allowing natural vegetation to develop in riparian zones, in many cases this will see ecological

[370] Riis *et al.,* (2020). Global Overview of Ecosystem Services Provided by Riparian Vegetation. Bioscience.

[371] Parkyn (2004). Review of Riparian Buffer Zone Effectiveness. MAF Technical Paper No: 2004/05.

[372] Restoring (or simply enabling the natural regeneration of) lost or degraded riparian zones may prove essential for the survival of cold water fish such as salmon (which have keystone functions in river ecosystems, such as nutrient return from sea to land) in areas their range is threatened by climate change. (See, as an example, *Scotland hopes to save wild salmon by planting millions of trees next to rivers).*

[373] Zhang et al (2010). A review of vegetated buffers and a meta-analysis of their mitigation efficacy in reducing nonpoint source pollution. J. Environ. Qual. 39:76–84. With variability depending on factors including the area of land receiving pollutants that drain through the particular riparian buffer zone (which underlines an additional value to having regular npHBLF such as hedges and tree lines, in the landscape) – see Prosser *et al*., 2020: A review of the effectiveness of vegetated buffers to mitigate pesticide and nutrient transport into surface waters from agricultural areas. J Environ Mgt.

[374] See Fennessy, M. & Cronk, J. (1997). The Effectiveness and Restoration Potential of Riparian Ecotones for the Management of Nonpoint Source Pollution, Particularly Nitrate. *Critical Reviews in Environmental Science and Technology,* 27(4):285-317 (1997). This appears particularly true for the removal of N and P. See Zhang et al (2010). A review of vegetated buffers and a meta-analysis of their mitigation efficacy in reducing nonpoint source pollution. J. Environ. Qual. 39:76–84.

	succession ensuring woody vegetation that is also efficient at reducing sediment, N, P. and pesticide pollution. However, where natural vegetation structure tends towards grasses or shrubs, such riparian buffers also provide valuable habitat and mitigation of pollution. Large rivers on average receive water from a larger catchment area and more tributaries and can accumulate high levels of pollution. Small water bodies are also vulnerable, and to small amounts of pollution that have a high relative impact. 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. They are also likely to be exceptionally vulnerable to climate change impacts and to local land management changes, all of which riparian buffers help to moderate[375]. Different widths of riparian buffer zones are suggested in relation to the size of the water body, in recognition of practicality and different riparian habitat needs from ditch verges to gallery forests. **Ditches** Farm drainage ditches are, analogous to hedges, important for biodiversity connectivity in agricultural landscapes[376]. **5 m** buffer zones are stipulated for ditches to retain their valuable habitat function, and to substantially reduce pollution. Though 5m is not adequate to remove all pollution, approx. 50-60% for N and P, for instance377, it is difficult to require more extensive buffer zones for ditches which may be numerous. Should the operator wish to meet npHBLF requirements by extending these buffer zones further, that could be a beneficial and efficient

[375] Kristensen, P. and Globevnik, L. (2014). European small water bodies. Biology and Environment.

[376] Herzon, I., Helenius, J. (2008). Agricultural drainage ditches, their biological importance and functioning. Biological Conservation: (141)

[377] Zhang et al (2010). A review of vegetated buffers and a meta-analysis of their mitigation efficacy in reducing nonpoint source pollution. J. Environ. Qual. 39:76–84.

	possibility. For example, Natural England[378] recommend 6m buffers for ditches). 5m is also pragmatic as the minimum required for 'bank stabilisation' and thus erosion control and maintenance of aquatic conditions379. **Rivers, streams, ponds & lakes etc less than 15m wide** Whereas buffers of ditches may be relatively narrow and still host key vegetation such as reedbeds, riparian verges of larger water bodies need to be wider to host their characteristic vegetation communities and dependent fauna. The 10m stipulation is in line with, for instance, the Brazil Forest Code (2012) for water bodies of this width. In Denmark, all open streams and lakes larger than 100m^2 must have 10m buffers, having had insufficient results on pollution mitigation at lower widths.[380] The stipulation of medium sized water bodies having 10m buffers is on the low end of the desirable width with respects to vegetation structure, but operators may choose to implement wider buffers at their discretion. 10m is not excessive, and often not enough. For instance, one study[381] found buffers of 12m to provide inadequate protection from nutrient pollution, though generally the benefits will be notable (often above 70% removal of P, N, sediment and pesticide[382]). "For low to moderate slopes, most filtering occurs within the first 10 m, but greater widths are necessary for steeper slopes…or where NPS [nitrogen/phosphorus/sediment] loads are particularly high."[383]

[378] Natural England (2011). Technical Information Note TIN100: Protecting water from agricultural run-off: buffer strips https://www.riverneneregionalpark.org/reference/brochures-downloads/nene-and-welland-support-for-farmer-action-nwsfa-downloads/protecting-water-from-agricultural-run-off-buffer-strips.pdf

[379] Hawes, E. & Smith, M. (2005). Riparian buffer zones: functions and recommended widths. Yale School of Forestry & Environmental Sciences.

[380] Müncha, et al (2016). Towards multifunctionality of rural natural environments? —An economic valuation of the extended buffer zones along Danish rivers, streams and lakes. Land Use Policy.

[381] Aguiar T, R. Jr., Rasera, K., Parron, L.M., Brito, A.G., Ferreira, M.T. (2015). Nutrient removal effectiveness by riparian buffer zones in rural temperate watersheds: The impact of no-till crops practices. Agricultural Water Management (149).

[382] Zhang et al (2010). A review of vegetated buffers and a meta-analysis of their mitigation efficacy in reducing nonpoint source pollution. J. Environ. Qual. 39:76–84.

[383] Hawes, E. & Smith, M. (2005). Riparian buffer zones: functions and recommended widths. Yale School of Forestry & Environmental Sciences.

	15m + water bodies The 30m stipulation is again at the low end of the desirable width of riparian zones, from a biodiversity and ecosystem services (B&ES) point of view, and whilst a significant contribution to B&ES, there are likely to be significant gains in circumstances where an operator wishes to expand the buffer width further. For instance, many birds are riparian obligates – requiring quality riparian habitat (such as, in the USA, the southwestern willow flycatcher, swallow-tailed kite and Bell's virio). Numerous studies show species of birds, also including forest-interior species, being excluded from riparian zones of greater size than the 30m stipulation herein. Studies show exclusions of species at various buffer widths from 40m even as wide as 175m (which one study found sufficient to retain 95% of bird species).[384] However, the 30m stipulation is line with the minimum requirement of the Brazil Forest Code (2012), requiring a width of between 30m and 100m – to be half the width of the water body. One study[385] points to the higher efficiency of woody vegetation zones of 36 m and 60 m widths, finding 36m as generally effective to reduce nitrate levels below water protection legislation and regulatory standards. Another[386] recommends 32.5 m buffer zones in any situation where surround land slopes more than 15%. Another study[387] found riparian zones (in this case, of native grassland) were essential of "more than 30m to either side of the river" to retain characteristic riparian fauna and flora.
3. Soil Management^	

[384] For a summary of various studies, see US Corps of Engineers (2000) - Width of riparian zones for birds. https://www.arlis.org/docs/vol1/EMRRP/946618517.pdf

[385] Aguiar T, R. Jr., Rasera, K., Parron, L.M., Brito, A.G., Ferreira, M.T. (2015). Nutrient removal effectiveness by riparian buffer zones in rural temperate watersheds: The impact of no-till crops practices. Agricultural Water Management (149).

[386] Hawes, E. & Smith, M. (2005). Riparian buffer zones: functions and recommended widths. Yale School of Forestry & Environmental Sciences.

[387] Samways & Pryke (2016). Large-scale ecological networks do work in an ecologically complex biodiversity hotspot. Ambio.

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 CO_2 and NO_3-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*[388]*. 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.*[389] [390] [391] [392] [393]
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.[394] **3.5 Soil conservation management**: No ploughing on steep slopes >17%, conservation crop rotation ensuring good soil cover, conservation tillage and	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

[388] Lamandé, Mathieu & Hallaire, Vincent & Curmi, Pierre & Pérès, Guénola & Cluzeau, Daniel. (2003). Changes of pore morphology, infiltration and earthworm community in a loamy soil under different agricultural managements. CATENA. 54. 637-649. 10.1016/S0341-8162(03)00114-0.

[389] See Jongmans et al., 2001 in Bottinelli, N., Henry-des-Tureaux, T., Hallaire, V., Mathieu, J., Benard, Y., Tran, T.D. and Jouquet, P., 2010. Earthworms accelerate soil porosity turnover under watering conditions. Geoderma, 156(1-2), pp.43-47.

[390] Pérès, G., Cluzeau, D., Curmi, P. and Hallaire, V., 1998. Earthworm activity and soil structure changes due to organic enrichments in vineyard systems. Biology and Fertility of Soils, 27(4), pp.417-424

[391] Lavelle, P.; Aubert, M.; Barot, S.; Blouin, M.; Bureau, F.; Margerie, P.; Mora, P.; Rossi, J.P. Soil invertebrates and ecosystem services. Eur. J. Soil Biol. 2006, 42, S3–S15.

[392] Blouin, M.; Hodson, M.E.; Brussaard, L.; Butt, K. A review of earthworm impact on soil function and ecosystem services. Eur. J. Soil Sci. 2013, 64, 161–182.

[393] BIO Intelligence Service (2014), Soil and water in a changing environment, Final Report prepared for European Commission (DG ENV)

[394] 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)

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	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: • 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. • 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 and control of invasive alien species (IAS)** **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.	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 management of the introduction and spread of invasive alien species.

4.5.3. 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. **4.5.4 Biocides (i.e., pesticides and plant protection products) are only used under exceptional circumstances to tackle IAS**, and in any case follow Integrated Pest Management principles in line with EC Regulation 1107/2009. "Candidates for substitution' are not used. • Actions to eradicate or manage invasive alien species (IAS) need to be undertaken in accordance with EU and national restrictions on pesticide use, and where applicable the national action plan on the sustainable use of pesticides and national codes of practice, • Actions to control IAS with biocides should only be taken if the overall benefit to biodiversity is expected to be positive. Rapid eradication measures should be proportionate to the impact on the environment, that non-lethal methods should be considered and used preferentially, and any action taken should minimise the impact on non-targeted species. The ultimate objective is to protect native species, if eradication measures would undermine this, they should not be taken.86 **Permission from the competent authority is required:** a. For use of biocides in Natura 2000 sites or other protected biodiversity areas if there is reason to think such locations could be affected b. If there is reason to believe a priority conservation species could be affected either inside or outside a protected area - as listed in IUCN national red list, Habitats and Birds Directives or equivalents beyond Europe. c. If the biocide is to be used near a freshwater body (i.e., within the riparian buffer zones described in Table 3, 2.3.1) *Key definitions:* *'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.*	
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).[395] **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[396];** Or implement crop rotation of at least 2 crops including at least one legume[397]. This can be implemented via intercropping or spatially	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.[398] Soil biodiversity benefits from soil rotations when sustainable practices applied. "Conservation tillage and crop rotations with legume support diversity of soil microbial communities.[399]

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

[396] Pierre-Eric Lauri, Benjamin Pitchers, Lydie Dufour, Sylvaine Simon. Apple farming systems – Current initiatives and some prospective views on how to improve sustainability.. 30. International Horticultural Congress IHC2018, Aug 2018, Istanbul, Turkey. ffhal-02737792f

[397] Panozzo A., Desclaux D. 2018. Durum wheat in olive orchard: more income for the farmers?. 4. European Agroforestry Conference. EURAF 2018, Nijmegen, Netherlands. 567 p. ⟨hal-02736509⟩

[398] BIO Intelligence Service. Environmental Impacts of the Different Crop Rotations in the European Union. Final report. 6 Sept 2010.

[399] N.Z. Lupwayi, W.A. Rice, G.W. Clayton (1998). Soil microbial diversity and community structure under wheat as influenced by tillage and crop rotation, Soil Biology and Biochemistry, Volume 30.

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

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

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.[400] 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[401] and is now adopted by the UNECE Executive Body for the Convention on Long-range Transboundary Air Pollution[402],
- The HELCOM[403] document *Revised Palette of measures for reducing phosphorus and nitrogen losses from agriculture[404],*

[400] 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.

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

[402] 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

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

[404] 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

- The draft delegated act of the Taxonomy to climate mitigation[405],
- The *Recommendations for establishing Action Programmes under Directive 91/676/EEC* developed by a consortium led by Wageningen University[406],
- The EU-Nitrative directive.[407]

Criteria	Rationale
1. The soil is covered with plants (crops that are sown before winter or cover and catch crops[408]) 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 example, in vineyards[409] as well as in dry areas where the cover can influence the water storage into the soil matrix.[410] [411] 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).	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%.[412]
2. The holding implements a yearly crop nutrient management and fertilisation plan, established with the help of guidelines	A nutrient management and fertilisation plan supports the integration of all the nutrient requirements of arable and forage crops on the

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

[406] 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.

[407] 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)

[408] 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.

[409] Metay A., Durocher E., Garcia L., Fried G., Richarte J., Ohl B., Bouisson Y., Enard C., Metral R., Gary C., Kazakou E. 2017. 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)

[410] Ziegler, AD, TW Giambelluca. 1998. The influence of revegetation efforts on hydrologic response and erosion, Kaho`olawe Island, Hawai`i. Land Degradation and Development 9:189-206.Ziegler & Sutherland 1998_CSSPA29_1253-1

[411] Hugo V., Zuazo D., Rocío C., Pleguezuelo R. 2009. Soil-erosion and runoff prevention by plant covers. A review. Environmental Science (archives-ouvertes.fr)

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

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[413], 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 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. a) 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)[414] [415], 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:	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.[420] 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 to maintaining sol physical structure.[421] [422] Negative humus balance is an indicator of long-term risk of soil fertility loss as well as in fluctuations in soil acidity.[423] 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 influences the ionic form in which the element is present in the soil.[424]

[413] 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.

[414] 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)

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

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

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

[422] Jean-François Ponge. Humus forms in terrestrial ecosystems: a framework to biodiversity. Soil Biology and Biochemistry, Elsevier, 2003, 35 (7), pp.935-945. ff10.1016/s0038-0717(03)00149-4ff. ffhal-00498465f (archives-ouvertes.fr)

[423] Nandi, J. B. (2007). Life in the soil: a guide for naturalists and gardeners. The University of Chicago Press.

[424] S. Bravo, J.A. Amorós, C. Pérez-de-los-Reyes, F.J. García, M.M. Moreno, M. Sánchez-Ormeño, P. Higueras. Influence of the soil pH in the uptake and bioaccumulation of heavy metals (Fe, Zn, Cu, Pb and Mn) and other

i.e., Soil Sampling Protocol from European Soil Data Center (ESDAC)[416] (Map of pH in Europe JRC. Soil pH in Europe 2010)[417] or the soil testing methods published by the FAO[418] (i.e., humus quality and annual humus balance, calculated as an area-weighted 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.[419] The farmer can prove that he has either outsourced the inspection to an expert or done it himself in a correct way.	
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 be applied earlier than 1 month before the start of the growing season. Periods of high rainfall are avoided (unexpected extreme weather events excluded).	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 [425] [426] [427] (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%*[428]).

elements (Ca, K, Al, Sr and Ba) in vine leaves, Castilla-La Mancha (Spain), Journal of Geochemical Exploration, Volume 174, 2017, Pages 79-83, ISSN 0375-6742 https://doi.org/10.1016/j.gexplo.2015.12.012)

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

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

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

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

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

[426] 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

[427] 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.

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

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.[429]
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.[430]
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.[431]
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 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.*[432] Not applying mineral or organic fertilisers at any time to water bodies directly bordering surface

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

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

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

[432] 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.

	waters helps to prevent the mobilisation and transfer of nitrate to the watercourses.[433]
8. No fertilization within 10m of High Biodiversity Landscape Features (HBLFs)[434]	

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

[434] *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 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

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Satisfy all of the criteria described in the Table below.

Criteria	Rationale
1. Harvest level	
1.1 Not overfished or undergoing overfishing[435] **For commercial catch fishing:** 10.1.1 **Operating in a fishery which complies with established catch limits** that are set: • At Maximum Sustainable Yield (MSY) with at least 50% of spawning biomass present relative to the unfished stock status • With fishing mortality (F) below the MSY level (Fmsy)[436] taking into account an ecosystem-based approach • With level of fish bycatch consistent with MSY level. If MSY is not available, for inland fisheries for instance, the principle remains the same. In this case, a management strategy evaluation at the fishery level is required to check the robustness of available reference points, proxies and harvest control rules with the implementation of a road map for the next five years in an adaptive framework to gather information on stock status. In this context, ecosystem-based approach to fisheries management must be taken into account. Indirect indicators such as	An ecosystem-based approach is required to assess the state of all stocks affected by 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*". Schaefer's original concept of Maximum Sustainable Yield ('MSY') implies that 50% of carrying capacity is required 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

[435] These criteria go beyond the requirements under the current CFP with scientific references to support the rationale behind it:

Pauly, D., & Froese, R. (2020). MSY needs no epitaph—but it was abused. *ICES Journal of Marine Science*

Cury P. M., Boyd I. L., Bonhommeau S., Anker-Nilssen T., Crawford R. J., Furness R. W., Mills J. A.et al. 2011. Global seabird response to forage fish depletion—one-third for the birds. Science, 334: 1703–1706.

Pikitch, E. et al. 2012. Little fish, big impact. Managing a crucial link in ocean food webs. Lenfest Ocean Program. Washington, DC. 108 pp.

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

[436] Stock assessments performed by ICES and the Scientific, Technical and Economic Committee for Fisheries (STECF)

constant landings, no fluctuation in Catch per unit effort (CPUE), no decrease in the more frequent total length of the target species, can be used as reference points to build a management evaluation in a management plan. **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)[437] with controls of adherence to fisheries regulations and correct reporting being in place. **1.1.3 Not operating in a fishery where targeted species are threatened or endangered**[438] **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	effectively set at MEY (maximum economic yield) being about 60% of carrying capacity.[439] Biomass at sea larger than MSY must be considered desirable, as it increases the resilience of the fish stocks, and when closer to MEY increases the profitability of the fleets exploiting the stocks. "*Not operating in a fishery where targeted and/ or bycatch species are threatened or endangered*." The CFP Basic Regulation (1380/2013) objectives apply to all stocks whether they are caught as target stocks or as bycatch stocks. In addition, the CFP Basic Regulation also sets out the obligation to apply an ecosystem-based approach to fisheries management. In order to do so, the status of all stocks affected by a given fishery should be taken into consideration when evaluating if a fishery is sustainable or not.[440] A minimum of 50% threshold enables stock abundance in order to provide food for fish-eating seabirds, marine mammal populations, and other large predators which allow to keep a resilient ecosystem to mitigate climate change.[441]

[437] This aligns with CFP requirements

[438] Targeted species lists (based on BHD, Regional Sea conventions, CITES, IUCN)

[439] For a summarized discussion, see: http://www.seaaroundus.org/fisheries-managers-should-not-abuse-maximum-sustainable-yield/, In addition please see 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

[440] https://www.clientearth.org/latest/documents/how-not-to-implement-the-ecosystem-based-approach-when-setting-total-allowable-catches-tacs/;https://www.clientearth.org/latest/documents/ask-the-right-question-get-the-right-answer-scientific-advice-for-bycatch-or-non-targeted-stocks-that-have-zero-catch-advice.

[441] Pauly, D., & Froese, R. (2020). MSY needs no epitaph—but it was abused. ICES Journal of Marine Science

Cury P. M., Boyd I. L., Bonhommeau S., Anker-Nilssen T., Crawford R. J., Furness R. W., Mills J. A.et al. 2011. Global seabird response to forage fish depletion—one-third for the birds. Science, 334: 1703–1706.

Pikitch, E. et al. 2012. Little fish, big impact. Managing a crucial link in ocean food webs. Lenfest Ocean Program. Washington, DC. 108 pp.

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

	Underpinning these criteria is a requirement for authorities to take actions to evaluate the status of stocks. Non-regulated fishing is not considered to be consistent with delivering a substantial contribution to biodiversity and ecosystems.
1.2 Avoid by-catch[442] **1.2.1. Minimizing and eliminating bycatch** *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.)* *Specific attention should be given to endangered, threatened and protected (ETP) species.* As a general principle, non-target species, bycatch should be minimised or eliminated. More specifically, the following mortality rates apply: • For birds: The threshold mortality rate from incidental seabird bycatch should be ≤1% of natural annual adult mortality of the species.[443]	Bycatch means unwanted catches as per the CFP definition "*An ecosystem-based approach to fisheries management needs to be implemented, environmental impacts of fishing activities should be limited, and unwanted catches should be avoided and reduced as far as possible*." Bycatch is defined as "*unwanted catches*" meaning when the species is not primarily target or commercialised. In addition, as per the CFP "*selective fishing techniques to avoid and reduce, as far as possible, unwanted catches must have high priority*". According to Article 7 of the CFP (2013): "*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;*

[442] 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

[443] 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

• For turtles: mandatory use of turtle excluding devices in areas where turtles are present. For small cetaceans: the threshold mortality rate from incidental bycatch should be ≤1% of the population size in that year in relevant sea basin.[444] • For other species: The threshold mortality rate from incidental catches of other marine mammals (including whales, pinnipeds~~...~~), sharks & rays should be close to non-existent with mandatory measures reducing mortality including the prohibiting of wire leaders and shark lines in longline fisheries and other catch mitigation techniques, and minimum standards for safe handling and release. • In addition, if sharks are caught and kept on board, implement a "fins naturally attached" policy as the only method to ensure both proper catch accounting as well as compliance with shark retention measures. **1.2.2. Only truly selective methods / gear** that have high selectivity of targeted species and low impact on the ecosystem are used The use of selective gear is supported by scientific evidence such as a strategic	*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."* Seabirds are most vulnerable to mortality on longline hooks during the short period between hooks leaving the vessel and sinking beyond the diving range of foraging seabirds. In trawlers, mortality is categorised into two broad types: cable-related mortality, including collisions with nets, cables, warp cables and paravanes; and net-related mortality, which includes all deaths caused by net entanglements.

In addition, see ASCOBANS resolutions, the resolution 8.5 from 2016 on monitoring and mitigation of small cetacean bycatch, the resolution 9.2 from 2020 on the Baltic proper harbour porpoise as well as the recommendations from the ASCOBANS and ACCOBAMS Joint Bycatch Working Group from 2021

The ASCOBANS 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). These are directly applicable to sea birds bycatch.

[444] Ibid.

or/and an environmental Impact Assessment (SEA or/andEIA) on gears interaction with the environment needs **1.2.4. Release bycatch when species have known survival possibility** granted through a discard plan for the fish species, gear and area considered. This especially applies to marine mammals (harbour porpoise)[445] **1.2.5. Report data through the EU catch registration system on control, under the data collection framework (or equivalent outside the EU)**[446] **1.2.5. Operating in a fishery that is fully documented with 100% observers' coverage (an onboard human observer OR electronic device,** including remote electronic monitoring) to ensure transparency on bycatch reporting. Investment can be authorised if a 5-year transition plan is planned based on a detailed roll out plan.	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).
2. Other species and habitat impacts^	
2.1 No take zones **2.1.1. Fishing in a fishery/area with an established and maintained 10% no take zone** (or so-called fishing restricted areas - FRA), prioritising sensitive habitats and ecosystem connectivity, EU Biodiversity Strategy requirements and the Nature Restoration Law. This should be evidenced in a fisheries management plan.	No take zone allows biodiversity to recover and encourage a spill over effect for the benefit of all including the fishers itself There are two types of spillover effect: "*ecological spillover (i.e., the net export of juvenile, subadult and adult biomass from MPAs outwards driven by density-dependent processes) and the fishery spillover (i.e., the proportion of this biomass that can be fished, taking into account regulations and accessibility). Underwater visual census and tagging/tracking may allow getting evidence of ecological spillover, while experimental catch*

[445] This is also specified in the landing obligation regulation from the CFP (2013).

[446] This aligns with CFP requirements

2.1.2. Fishing in a fishery/area where essential fish habitats (EFB) and sensitive habitats (SB) - as assessed in line with best available scientific advice - are restricted	*data are essential to assess and monitor fishery spillover, which is the main component of FRA/MPAs that can provide direct benefit to local fisheries*."[447] *"Because larger fish produce more offspring than smaller fish per unit body mass and fish are often larger inside FRA/MPAs, they should exhibit disproportionately higher reproductive output as compared to fish outside of FRAs. We show that the reproductive contribution of fish inside FRAs has been systematically underestimated and that fisheries yields can be enhanced by the establishment of reservoirs of larger, highly fecund fish. Larger fish play a disproportionate role in driving the dynamics of fish populations and should therefore be accounted for accordingly. MPAs represent an essential tool for protecting larger fish, and it is our hope that a more accurate accounting of the value of FRAs will increase support for their use by a wide variety of stakeholders*."[448] No take zones should cover at least 10% of our seas locally within a fishery, regionally or nationally) and be decided in consultation with stakeholders. Temporary closures are not a sufficient alternative to no-take zones – they do not have a positive effect in species ecological parameters and habitat recoveries compared to areas open to fisheries all year-around. Further, it is difficult to find time areas closures that result in reduction of bycatch while maintaining target catches to original levels.

[447] Elevated trawling inside protected areas undermines conservation outcomes in a global fishing hot spot by Manuel Dureuil et al. (2018); Underestimating the benefits of marine protected areas for the replenishment of fished populations by Dustin J Marshall et al. (2019); Effective Coverage Targets for Ocean Protection by Bethan C. O' Leary et al. (2016); Small-sized and well-enforced Marine Protected Areas provide ecological benefits for piscivorous fish populations worldwide by Irene Rojo et al. (2019)

[448] No-take marine reserves are the most effective protected areas in the ocean by Eric Sala et al. (2018); The Structure of Mediterranean Rocky Reef Ecosystems across Environmental and Human Gradients, and Conservation Implications by Eric Sala et al. (2012).; The efficiency of full protection in MPAs by Diego K Kersting at al. (2020); Marine partially protected areas: drivers of ecological effectiveness by Mirta Zupan et al. (2018); Review of the benefit of no-take zones by Craig Dahlgren (2014); Evaluating the biological effectiveness of fully and partially protected marine areas by Marija Sciberras et al. (2013); Protecting the global ocean for biodiversity, food and climate by Eric Sala et al. (2021)

	Therefore, temporary closures might not be effective in meeting the conservation goals of sustainable fisheries management. To enhance their effectiveness, other issues, such the relocation of fishing activities to adjacent areas without costs and improvements in design (such as effort redistribution, closure timing, placement of closures, and effects on target catch) should be taken into account when planning temporal closures.[449]
2.2 No wildlife persecution: No killing, injury or harassment of competitor species (such as seals, dolphins, sharks, seabirds, 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 is allowed when claiming SC to biodiversity.
2.3 No harm to marine or freshwater habitats[450]: Habitats should be left undisturbed including seabeds and vulnerable marine ecosystems	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 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 **2.4.1. No discarded gear and minimised gear loss** **2.4.2. All gear must have a tagging (ID), reporting, recovery and recycling, use of biodegradable materials** **2.4.3. No single-use equipment is used**	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 as it continues to catch fish and other animals for a long period of time impacting fish populations and habitats, and can also release microplastics.[451]

[449] Evaluating socio-economic and conservation impacts of management: A case study of time-area closures on Georges Bank by David M. Keith et al. (2020); Fisheries management in the face of uncertainty: Designing time-area closures that are effective under multiple spatial patterns of fishing effort displacement in an estuarine gill net fishery by Liza A. Hoos et al. (2019)

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

[451] Ghost fishing in European waters: Impacts and management responses, Marine Policy, Volume 31, Issue 4, July 2007, Pages 488-504; Fate of lost fishing gears: Experimental evidence of biofouling colonization patterns from the northwestern Mediterranean Sea, Environmental Pollution, Volume 268, Part B, 1 January 2021, 115746; Use of biodegradable driftnets to prevent ghost fishing: physical properties and fishing performance for yellow croaker S. Kim, P. Kim, J. Lim, H. An, P. Suuronen, Animal Conservation, 01 February 2016

3. Other^	
3.1 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.[452]
3.2. Reporting **3.2.1. No record of illegal, unreported and unregulated (IUU) fishing activity in the last 5 years**[453] **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.** Small scale fisheries (vessels less than 12m length) can use adaptive technologies that aim at reporting catch and bycatch. Devices to provide near real time vessel tracking are available on board.	An operator engaging 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.[454] [455] Fully documented fisheries ensure transparency on bycatch reporting. 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

[452] Detecting aquatic invasive species in bait and pond stores with targeted environmental (e)DNA high-throughput sequencing meta barcode assays: Angler, retailer, and manager implications, Matthew R. Snydera, Carol A. Stepiena, Nathaniel T. Marshallab, Hannah B. Schepplerb, Christopher L. Black, Kevin P. Czajkowskid, Biological Conservation, Volume 245, May 2020, 108430

[453] This aligns with CFP and IUU regulation

[454] 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/201710/Remote%20Electronic%20Monitoring%20in%20UK%20Fisheries%20Management_WWF.pdf

[455] Remote electronic monitoring and the landing obligation – some insights into fishers' and fishery inspectors' opinions, Marine Policy, Volume 76, February 2017, Pages 98-106; IOTC, COMPARING ELECTRONIC MONITORING SYSTEM WITH OBSERVER DATA FOR ESTIMATING BYCATCH AND DISCARDS ON FRENCH TROPICAL TUNA PURSE SEINE VESSELS (CAT OOE PROGRAM); Electronic monitoring trials on in the tropical tuna purse-seine fishery

J. Ruiz, A. Batty, P. Chavance, H. McElderry, V. Restrepo, P. Sharples, J. Santos, ICES Journal of Marine Science, Volume 72, Issue 4, May 2015, Pages 1201–1213; ISSF 2018-03: Efficiency of Electronic Monitoring on FAD-Related Activities by Supply Vessels in the Indian Ocean Plet-Hansen et al., 2016ahttps://doi.org/10.1016/j.marpol.2016.11.028

VMS transponders are compulsory on board all vessels with a ping rate more frequent than every 2 hours.	potential for full documentation and compliance with the CFP's Landing Obligation.[456] VMS on board all vessels is as per the proposal for new fisheries control regulation currently being debated. This would be complementary to and deter fishing inside MPAs/FRAs.
3.3 No Discards or high-grading[457]	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 • Phase down HFC in compliance with the Montreal Protocol including its Kigali amendment on HFCs • Where processing onboard, compliance with the F-gas Regulation (EU) No 517/2014: banning the use of Fluorinated GHGs (F-gases) including hydrofluorocarbons (HFCs) For new vessels: • Comply with criteria in DNSH to mitigation for freight shipping
(2) Climate change adaptation	DNSH as set out in Appendix 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 the Commission Decision (EU) 2017/848 of 17 May 2017 laying down criteria and methodological standards on good environmental status of marine waters and specifications and standardised methods for monitoring and assessment, as well as set out in Appendix B

[456] Ibid.

[457] This aligns with the CFP.

water and marine resources	of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Article 12 of the Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment.
(4) transition to a circular economy	N/A
(5) Pollution prevention and control	Fishing vessels with low GHS-emissions (electric, fuel-efficient and/or using renewable fuels) is required.[458]

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.[459] 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

[458] Suuronen et al. 2012 _ Low Impact and Fuel Efficient (LIFE) Fishing _ Fish Res 119-120 _ 135-146

[459] 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 'freshwater 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 has minimal impact through the use of fishing gear and fishing behaviour that avoid targeting threatened species, avoid by-catch[460] and avoid damage to habitats. This “low impact fishing” reduces the direct pressures on biodiversity and ecosystems. However, further practices (e.g., no-take zones)

[460] 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.

can be established at the ecosystem level to reduce extractive pressures further, which then enable the recovery and restoration of biodiversity and habitats.

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 exploited and non-exploited fish stocks and other marine species, as well as 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.[461]

- The EU Biodiversity Strategy which has key commitments that by 2030:

  - "… 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";

[461] For example, 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)

- "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 pursued;
  - 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.

However, it is noted that the criteria are not limited by these and can and do go beyond legal obligations as needed to ensure a substantial contribution to biodiversity and ecosystems.

Approach to setting the criteria

All types of fishing (marine or freshwater fishing for commercial, recreational or sport 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, that is are intended to prevent significant harm to biodiversity and ecosystems. 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.

Many of these criteria relate to requirements on the fishery rather than the operator. As fishing is about exploitation of a shared resource, an operator on their own cannot solve problems like overfishing. Any extraction (however minimal) from an overfished area is harming biodiversity and ecosystems. The only way to address this is on collective level.

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 addressed in the criteria 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. 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, and use globally recognized terminology. Once these criteria are established, 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

2.1 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

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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 must comply with all sets of technical criteria (see visual in the rationale).

A. The produced substance is not fulfilling any hazardous properties neither specified in the list of Substances of Concern included below nor Acute toxicity for health (Cat. 1-3), Severe eye damage (Cat. 1) and Skin corrosion (Cat. 1), and Acute toxicity for environment, Aquatic Acute Cat. 1 (H400).

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) except where their use has been proven to be essential for the society and the production process is done under strictly controlled conditions.

AND

C. The produced substance is used as a replacement. Therefore, the operator has to demonstrate that an equivalent substance with comparable functionality, fulfilling any hazardous properties either included in the list of Substances of Concern or Acute toxicity for

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health (Cat. 1-3), Severe eye damage (Cat. 1) and Skin corrosion (Cat. 1), and Acute toxicity for environment, Aquatic Acute Cat. 1 (H400), is currently produced[462].

AND

D. The activity must comply with requirement D1, D2 and D3 regarding pollution at the facility.

D1. Where the activity falls within its scope, the operator must demonstrate emission levels below the mid-point of the BAT-AEL ranges[463],[464] set out in:

a) The Best Available Techniques Reference Document (BREF) for the large volume inorganic chemicals- Solids and others industry.
b) The 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 impact occurs. This assessment shall notably ensure that plants within the BAT-AEL range(s) moving to the mid-point ambition will not trigger significant cross media effects, negating the Substantial Contribution of the set technical screening criteria.

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

[463] 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

[464] 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.

Installations that have been granted a derogation as per the procedure outlined in IED article 15(4) are not considered as fulfilling the TSC.

D2. The operator has to apply Continuous Emission Monitoring Systems (CEMS), Continuous Effluent Quality Monitoring Systems (CEQMS) and other measures ensuring the regular verification of non-deterioration of groundwater quality.

D3. The operator must apply solvent waste segregation for solvent recovery from concentrated waste streams – when applicable. The maximum solvents loss from total inputs cannot exceed 3% lost. Total volatile organic compound (TVOC) recovery efficiency must be at least 99%.

The operator must verify that no diffuse emission beyond the criteria specified below as to the ppmv thresholds by carrying out Leak detection and repair (LDAR) campaigns, at least every 3 years. Investments for the use of high integrity equipment is promoted, provided that these are installed in existing plants for cases mentioned under BAT 23b of the WGC BREF, whereas the pressure threshold is brought to 200 bar. The minimal verification schedule may be reduced in those cases where quantification of total VOC emissions from the plant is periodically qualified with tracer correlation (TC) or with optical absorption-based techniques, such as differential absorption light detection and ranging (DIAL) or solar occultation flux (SOX) or measures of other equivalent performance.

Diffuse emissions of substances with hazardous properties CMR1A or 1B should strive to not exceed a concentration of 100 ppmv for CMR1A or 1B. Such LDAR campaigns shall have the features described in BAT19 of the WGC 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 5000 ppmv, which shall be reviewed and updated for the continuous improvement of the installation. Solvent losses and recovery efficiency of VOC should be monitored based on a solvent management plan using a mass balance for verification of compliance, as per Chapter VII of the Industrial Emissions Directive (IED, 2010/75/EU).

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)
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 tCO_2e per tonne of product (Calculated in accordance with Regulation (EU) 2019/331) from the production process are lower than the median value[465] of the data collected in the context of establishing the EU ETS (Emissions Trading Scheme) industrial benchmarks for the period of 2016-2017.

[465] 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.

(2) Climate change adaptation	DNSH as set out in Appendix 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 substances within Acute toxicity for health (Cat. 1-3), Severe eye damage (Cat. 1) and Skin corrosion (Cat. 1), Acute toxicity for environment, Aquatic Acute Cat. 1 (H400) categories, and Substances of Concern according to the list included in this Screening Criteria. 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 must 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	The activity assesses the availability of and, where feasible, adopts techniques that support: 1. Reuse and use of secondary raw materials and reused components in products manufactured 2. Design for high durability, recyclability, easy disassembly and adaptability of products manufactured 3. Waste management that prioritises recycling over disposal, in the manufacturing process 4. Information on product ingredients along the supply chain
(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appendix 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.[466]

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. Diffuse emissions of substances with hazardous properties CMR1A or 1B should strive to not exceed a concentration of 100 ppmv for CMR1A or 1B. Such LDAR campaigns shall have the features

[466] https://eippcb.jrc.ec.europa.eu/reference/

described in BAT19 of the WGC 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 5000 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.

2.2 Manufacture of plastic packing goods

Description of the activity

The economic 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 either

the criteria for use of circular feedstock and design for recycling in practice or

the criteria for design for reuse in practice and design for recycling in practice.

Use of circular feedstock:

- At least 85% of the packaging product by weight consists of mechanically recycled post consumer material, chemically recycled, biobased or CCU (Carbon Capture and Utilization) based material.

Design for reuse in practice:

- The packaging product 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

Design design for recycling in practice

- The packaging product is designed to enable sorting and recycling at the end of life.
- For the packaging to be evaluated as recyclable, collection, sorting, and recycling is proven to work in practice and at scale, or is proven to be on track to work in practice and at scale.
- Collection, sorting, and recycling works 'in practice and at scale' if the plastic packaging material (e.g., PE, HDPE, LDPE, PP) achieves a minimum recycling rate of 50% in line with the 2025 target for plastic set by the Directive (EU) 2018/852[1] 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 100 million inhabitants.
- Collection, sorting, and recycling is on track to work 'in practice and at scale' if the packaging material achieves at least a recycling rate that is proportionate to filling the gap between a base year recycling rate and the 50% target for plastic set by the Directive (EU) 2018/852[467].
- 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

[467] If and when EU target for plastics is formally provided at a more granular level (e.g., PE, HDPE, LDPE, PP for plastics), then these targets might replace the one currently set by Directive (EU) 2018/852 and used in this definition

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. This includes certification according to relevant internationally recognised home-compostability certification schemes (TÜV AUSTRIA Belgium (OK Compost Home), DIN CERTCO (DIN-Geprüft Home compostable), AfOR (FILM home compostable), and ABA (Home compostable) or complying with internationally recognised home-compostability testing norms (NF T 51-800, AS 5810) as well as the availability of collection and organic recycling systems or a significant share of home-composting where the packaging is put on the market.

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 Appendix 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 Appendix 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 Appendix C of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852 For the production of the plastic polymers 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/2019-11/pol_bref_0807.pdf). No significant cross-media effects occur.
(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appendix D of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852 Any biomass used for packaging (i.e., renewable feedstock) complies with the sustainability requirements of the EU regulatory framework, including Part A of Annex IX of Directive (EU) 2018/2001, 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. 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. 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.

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

Use of circular feedstock.

Threshold of 85 % with multiple examples existing on the market. Best cases currently achieve max 98/99% due to virgin material in labelling adhesives or in master batch with dye for coloured packaging – otherwise only clear and white plastic packaging would be possible.

The demand for recycled content is stimulated through this criterion, the supply through the criteria for "Design of the product". 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 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. Signalling this importance, the post-consumer part is often the largest volume and the focus of reporting: look e.g., for plastics at the Single-Use Plastics Directive (EU) 2019/904 (Article 13 '*data on the post-consumption waste of single-use plastic products'),* and PlasticsEurope's Plastics - The Facts 2020 (p30). This furthermore allows to align with EU legislation & initiatives, including the Single-Use Plastics Directive (EU) 2019/904 aims to tackle environmental damage from "*commonly used fast-moving consumer products that are discarded after having been used once for the purpose for which they were provided"* (Recital 5)*,* so focusing on post-consumer. EU Circular Plastics Alliance - **Guidance on Waste Definitions** (Sep 2021), p26 in the 'Packaging WG: use of recycled plastics' section: "*It is assumed that the amount of pre-consumer waste will not increase significantly as production waste is limited. The growth must come from post-consumer recyclates.*". In addition, this is aligned with EU and internationally recognised type 1 ecolabels as exclusion of pre-consumer waste in the recycled content calculation is in line with the requirements in EU C(2021) 7500 final*,* ANNEX I: EU Ecolabel criteria for awarding the EU Ecolabel to cosmetic products: "*The applicant shall provide a signed declaration from the packaging manufacturer for the content of postconsumer recycled material or material from renewable origin in the packaging […] The applicant shall provide third party verification and traceability for postconsumer recycled content."*)The Blue Angel, Products made from Recycled Plastics, DE-UZ 30a: *"The applicant shall submit a certificate (including report) pursuant to the EuCertPlast certification scheme (including a calculated and plausibility-checked verification of the post-consumer percentage) to verify the origin and composition of the PCR materials used."*Its feasibility has been shown by existing practices, such as Magnum's rPP ice cream tub: PlasticsEurope and PackagingWorld. 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, and thus allows to make this distinction in a standardised way. Of course, pre-consumer recycled content can be included too, but it won't count towards meeting the target.

Design for reuse in practice

With its first “reuse cycle” a reusable packaging product starts to replace potential virgin feedstock and can be considered a contribution to a circular economy. However, reusable packaging tends to be designed to be more durable and therefore more material intensive, requiring several rotations to achieve break-even as shown in various case studies.

Furthermore, this criterion ensures alignment of substantial constribution criteria along the value chain and with the users of plastic packaging products for example for food and beverage.

Design of the product.

For plastic, Directive (EU) 2018/852 sets a 50 % minimum recycling targets by weight for 2025. Collection and in particular recovery rates vary substantially across the EU as well as on local and regional level, as well as between polymers (e.g., PET, PE, PP, HDPE). In order for collection, sorting, and recycling to be able to evolve, the criteria offer the opportunity to demonstrate that the recycling systesm for the plastic packaing work at scale either in the jurisdiction where the packaging is put on the market or in multiple regions that collectively represent at least 100 million inhabitants or can be demonstrated to be on track to work ‘in practice and at scale’. If and when EU targets are formally provided at a more granular level, then these targets replace the material-level ones currently used in this definition. For all packaging materials, if and when EU targets are formally provided at a more granular level (e.g., PET, PE, PP for plastics; clear glass, green glass for glass), then these targets might replace the material-level ones currently set by Directive (EU) 2018/852 and used in this definition.

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.

The inclusion of 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. In particular, the intended after-use pathway is collection of the packaging and nutrient contamination as part of the organic waste stream and further industrial treatment through a waste management infrastructure (e.g., industrial composting or anaerobic digestion). The more stringent home-compostability has been required for regions in which the infrastructure is still being built or in which adequate home-composting is in place. Nevertheless, collection and industrial processing is the intended option.

Do no significant harm ('DNSH')

Alignment with DNSH defined for similar manufacturing activities in First Delegate Act.

2.3 Manufacture of 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 lifetime of the item. The nomial lifetime of the item equivalent to the technical durability of the product, assessed upon 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 or on any product-specific standard relying on EN 45552:2020. 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.
- ‘Professional repairer’ means an operator or undertaking which provides services of repair and professional maintenance ofproducts under this activity.

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. For products covered by requirements on the availability of spare parts under Directive 2009/125/EC and implementing acts adopted under that Directive, key spare parts are considered to be those listed in Annex to the most recent implementing act for each product group

  - Where no legal requirement apply, key spare part should be available for at least 8 years after production ceases.

- Where no life 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.

<u>Design for remanufacturing:</u>

- 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) or on any product-specific EN standard relying on EN 45555:2019. All following requirements are met:

- Product recyclability is above 80%. Product recyclability is measured according to EN 45555:2019 or on any product-specific EN standard relying on EN 45555:2019.
- 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. No Substances included in REACH candidate list (within 6 months following the publication the last update of the candidate list in force on 1st

January of the reporting year), except if essential use is proven or if use is allowed under RoHS as detailed in criteria n°2 of this section.

2. RoHS exemptions are limited to the following three:
    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 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	Polycyclic Aromatic Hydrocarbons (PAHs) shall not be present at concentrations greater than or equal to individual and sum	The individual concentration limits for PAHs restricted under

and contaminant	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 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	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
iii) Biocidal products	Biocidal products intended to provide an anti-bacterial function	N/A

	Derogation for materials sold in hospitals and for healthcare applications	
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 and no halogenated flame retardants. Derogations for the use of TBBPA is allowed for Printed Circuit Boards only.

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 significantly populated class on the energy label applicable to the product range.

(2) Climate change adaptation	DNSH as set out in Appendix 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 Appendix 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 Appendix 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 Appendix 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.

This activity equally covers industrial and consumer goods.

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. To be on the safe side, this is why, the proposal is only to refer to EU best in class instruments, in order not to create loopholes or inconsistencies from one country to another.

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.

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 level playing field between products covered and those not covered in the scope of EU Ecolabel critera is fully kept in mind as generic criteria are heavily inspired by existing EU Ecolabel criteria.

In fact, 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 field**), 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.

Regarding substances of concern, the criteria go beyond current legal requirements. The ambition is to encourage the traceability, reporting and phasing out of legacy substances, which impede the transition to a circular economy. Criteria have been set out keeping in mind the specificities of the sectors (criteria applying to textiles sector are more stringent for instance). The following 3 RoHS exemptions were kept: exemptions 6(c), 7(a) and 7(c)1, for which a recent report from Oeko Institute (Study to assess requests for a renewal of nine exemptions 6(a), 6(a)-I, 6(b), 6(b)-I, 6(b)-II, 6(c), 7(a), 7(c)-I and 7 (c)-II of Annex III of Directive 2011/65/EU (Pack 22) – Final Report, February 2022) found that no substitute currently exist for these 3 applications (see p. 109, and 179).

Given the ambition of the chemicals strategy to minimise and substitute as far as possible substances of concern, existing evidence that the use of other RoHS exemptions can be avoided (see reports from the Oeko Institute, the fact that existing ecolabels already exclude certain exemptions (such as the EU Ecolabel for electronic displays which does not allow the use of exemptions 3 or 8(b)), the feedback received which only indicating as missing from the draft TSCs an derogation to exemption 6(c), and the voluntary nature of the taxonomy;

products using other RoHS exemptions are not to be considered as making a substantial contribution to the circular economy objective.

Also, recommendations in this section are based on exclusion of substances rather than on exposure. Indeed, for the circular economy, a key aspect is to ensure the phasing out of all legacy substances, regardless of where they are in the product - since the ultimate objective is to recirculate materials into the economy.

Where product specific legislation applying to products covered by this activity exclude specific substances, we align with the legislation and make it a horizontal exclusion (for instance in the case of halogenated flame retardants, in accordance with Ecodesign requirements applying to displays).

Regarding commercial guarantee, best in class type of labels introduce this kind of requirements - even more stringent (see criteria for electronic displays: ' Commercial guarantee: without prejudice to the legal obligations of the seller under national law on legal and commercial guarantees, the applicant shall provide at no additional cost a minimum of a 3-year commercial guarantee during which time they shall ensure the goods are in conformity with the contract of sale. This guarantee shall include a service agreement with pick-up and return for cases where repair in not done on-site; ').

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.

2.4 Furniture: manufacturing, repairing/refurbishing/remanufacturing and sale of spare parts, sale of second-hand, product-as-a-service and other circular use- and result-oriented service models

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, refurbishment and remanufacturing of goods produced by the activities classified under NACE code C31, where, for the purpose of this file, in line with definitions by the International Resource Panel by the United Nations Environment Programme[468]:

- 'repair' means the process of returning a faulty product to a condition where it can fulfil its intended use;
- 'refurbishment' means modification of a product to increase or restore its performance and/or functionality or to meet applicable technical standards or regulatory requirements, with the result of making a fully functional product to be used for a purpose that is at least the one that was originally intended;
- 'remanufacturing' means a standardized industrial process that takes place within industrial or factory settings, in which products are restored to original as-new condition and performance or better, typically placed on the market with a commercial guarantee.

Replacement of consumables and maintenance are both excluded from these activities.

Sale of furniture. Included activities are classified under NACE codes:

- G46 Wholesale trade, except of motor vehicles and motorcycles
- G47 Retail trade, except of motor vehicles and motorcycles

[468] IRP (2018). *Re-defining Value – The Manufacturing Revolution. Remanufacturing, Refurbishment, Repair and Direct Reuse in the Circular Economy.* Nabil Nasr, Jennifer Russell, Stefan Bringezu, Stefanie Hellweg, Brian Hilton, Cory Kreiss, and Nadia von Gries. A Report of the International Resource Panel. United Nations Environment Programme, Nairobi, Kenya https://www.resourcepanel.org/reports/re-defining-value-manufacturing-revolution

in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006, limited to trade in goods produced by the activity classified under NACE code C31.

Sale of spare parts beyond legal obligations, for use in goods produced by the activities classified under NACE code C31. where, for the purpose of this file and in line with Directive 2011/65/EU, 'spare part' means a separate part of a product that can replace a part of a product. The product cannot function as intended without that part of the product. The functionality of a product is restored or is upgraded when the part is replaced by a spare part.

Substantial contribution to transition to a circular economy

The economic activity complies with one of the following:

A. 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:

A.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 Generation 5, and the Blue Angel (The German Ecolabel) for Mattresses or for Low-Emission Furniture and Slatted Frames made of Wood and Wood-Based Materials.

A.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 the relevant criteria of Nordic Swan Ecolabelling (O4-O6), EU Ecolabel for furniture (Criterion 9.1), EU Ecolabel for bed mattresses (Criterion 12.2), or equivalent requirements that relate to the durability, safety, and strength of the furniture products within scope.

- **Warranty**: The sold product is covered by a sales contract that complies with the requirements of Directive (EU) 2019/771. In particular, these requirements cover conformity of the product, liability of the seller (including the option of a shorter liability or limitation period), burden of proof, remedies for lack of conformity, repair or replacement of the goods, and commercial guarantees, among other requirements.

- **Spare parts** can be installed without specialist knowledge and without the use of specialist equipment, unless specialised skills and/or specialised tools in line with patent act definition ‘person skilled in the art’ are required for safety reasons (such as in the case of electrical components). In that latter case, the manufacturer has explicitly specified this need and the reason. The sold spare parts are covered by a sales contract that complies with the requirements of Directive (EU) 2019/771. In particular, these requirements cover conformity of the product, liability of the seller (including the option of a shorter liability or limitation period), burden of proof, remedies for lack of conformity, repair or replacement of the goods, and commercial guarantees, among other requirements.

- **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 shall be provided. Disassembly and replacement operations shall be capable of being carried out without specialist knowledge and without the use of specialist equipment, unless specialised skills or tools available to those skilled in the art (use of the term in line with language in patent literature and legislation, e.g., any trained electrician, carpenter, locksmith, as applicable) are required for safety reasons (such as in the case of electrical components). In that latter case, the manufacturer has explicitly specified this need and the reason. The economic activity complies with the following:
    - Technical illustrations that show how the furniture can be assembled/disassembled using identified basic tools and unskilled labour is provided digitally and on paper on request, free-of-charge (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 is available for download on the manufacturer's or retailer's

website or on a digital product passport 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:
    - The Safety Data Sheet according to REACH Annex II and REACH Art. 31 (1.b) indicates that the substance or mixture meets the PBT or vPvB criteria in REACH Annex XIII
    - The Safety Data Sheet according to REACH Annex II indicates in section 12.2 that the substance or mixture is not inherently biodegradable according to OECD 302 testsHazardous 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, Generation 5
  - Blue Angel for Mattresses or for Low-Emission Furniture and Slatted Frames made of Wood and Wood-Based Materials

- **Transparency on material content:** Transparency 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 (digital) product 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** stem from FSC-certified or PEFC-certified 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. Wood, wood fibres or wood particles are not sourced from areas of high conservation value. **Cotton,**

wool or other natural fibres used in the textiles are 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.

B. The economic activity consists of repair, refurbishment and/or remanufacturing furniture that has been used for its intended purpose before by a customer (household or organisation), complying with the following:

- In case of repair and refurbishment, replaced parts are covered by a sales contract that complies with the requirements of Directive (EU) 2019/771. In particular, these requirements cover conformity of the product, liability of the seller (including the option of a shorter liability or limitation period), burden of proof, remedies for lack of conformity, repair or replacement of the goods, and commercial guarantees, among other requirements.

- In case of remanufacturing, the remanufactured piece of furniture is covered by a sales contract that complies with the requirements of Directive (EU) 2019/771. In particular, these requirements cover conformity of the product, liability of the seller (including the option of a shorter liability or limitation period), burden of proof, remedies for lack of conformity, repair or replacement of the goods, and commercial guarantees, among other requirements.

  The product's material and components that have not been reused in the same product are where possible reutilised elsewhere, or recycled.

C. The economic activity consists of selling second-hand furniture that has been used for its intended purpose before by a customer (household or organisation), possibly after its repair, refurbishment and/or remanufacturing, and complies with the following:

- The sold product is covered by a sales contract that complies with the requirements of Directive (EU) 2019/771. In particular, these requirements cover conformity of the product, liability of the seller (including the option of a shorter liability or limitation period), burden of proof, remedies for lack of conformity, repair or replacement of the goods, and commercial guarantees, among other requirements.

- The product's material and components that have not been reused in the same product are where possible reutilised elsewhere, or recycled.

D. Design and implement a business model that extends lifespan in practice. The economic activity complies with the following:

D.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.

D.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).

E. The economic activity consists of the sale of spare parts beyond legal obligations, complying with the following:

- Each sold spare part is covered by a sales contract that complies with the requirements of Directive (EU) 2019/771. In particular, these requirements cover conformity of the product, liability of the seller (including the option of a shorter liability or limitation period), burden of proof, remedies for lack of conformity, repair or replacement of the goods, and commercial guarantees, among other requirements.

- Each sold spare part for a product replaces, or intends to replace in future, an existing part in order to restore or upgrade the product's functionality. For example, the existing part may have broken down and thus needs replacement for the product to function properly.

Do no significant harm ('DNSH')

(1) Climate change mitigation	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 gCO_2e/kWh.
(2) Climate change adaptation	DNSH as set out in [Appendix A of Annex 1 to the Commission Delegated Regulation (EU) …/…]
(3) Sustainable use and protection of	• 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.

water and marine resources	• 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 A., 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. 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).
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 repair, refurbishment and remanufacturing of furniture produced by the activities classified under NACE code C31. As 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 sale of second-hand furniture, with included activities classified under NACE codes: G46 Wholesale trade, except of motor vehicles and motorcycles and G47 Retail trade, except of motor vehicles and motorcycles in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006, limited to trade in goods produced by the activity classified under NACE code C31.

Inclusion of product-as-service and other circular business models as crucial aspect of circular vaue strategies. Shifting ownership from customer to provider/producer changes the dynamics, creating more incentives for better design, maintenance, repair and other lifespan-extending activities.

Inclusion of sale of spare parts as a key activity to extend lifespan from both consumer and professional repair/refurbish/remanufacture perspective.

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 different ways:

  A. Designing and manufacturing new furniture to enable reuse, repair and remanufacturing

  B. Extending lifespan of existing furniture items through repair, refurbishment and/or remanufacturing

  C. Extending lifespan of existing furniture items through sale of second-hand furniture

  D. Extending lifespan of new and existing furniture through circular business models

  E. Enabling extended lifespan through sale of spare parts by supporting repair and refurbshment

A. Designing and manufacturing new furniture to enable reuse, repair 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.
- On durability for example, the taxonomy allows for "equivalent requirements that relate to the durability, safety, and strength of the furniture products within scope". In this

context, the EU Ecolabel criterion 9.1 already refers to relevant EN standards listed in Appendix IV of the EU Ecolabel criteria. Even if certain furniture category is not covered by that list, we consider it being sufficient for the purpose of the taxonomy. For verification, a declaration is needed stating which standards (if any) are applicable to the products within scope, supported by test reports from either the furniture manufacturer or component part/material suppliers, as appropriate.

- Guarantee 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).

In particular, regarding TR Art 13.1.(d) ('*substantially reduces the content of hazardous substances and substitutes substances of very high concern in materials and products throughout their life cycle, in line with the objectives set out in Union law, including by replacing such substances with safer alternatives and ensuring traceability*') and in order to enable extension of safe and functional lifespan, and enable reuse, repair, refurbishment and remanufacturing, specific criteria are included on VOC emissions.

Regarding the part of disassembly and reassembly that requires specialist tools or specialised skills, there is a limitation to those situations only where clear, potential danger exists. Examples of such situations are:

- Furniture that is deliberately designed in such a way that the user or final customer cannot disassemble it with standard tools, eg school furniture (chairs and desks) and furniture for public areas;
- Furniture for which the use of skilled labour and/or specialist tools are required during disassembly, such as electrical components, motors, etc, to ensure a safe procedure;

- Furniture for which adjustment work or attachment to a building structure is carried out during or after disassembly and which has an influence on the furniture itself

B. Extending lifespan of existing furniture items through repair, refurbishment and/or remanufacturing

See C.

C. Extending lifespan of existing furniture items through sale of second-hand furniture, possibly after repair, refurbish and/or remnaufacturing

- Reselling, possibly after repair, refurbish and/or remanufacturing, can extend lifespan of existing furniture items, and facilitates collection of the furniture.
- Guarantees are based on requiring a sales contract that complies with the requirements of Directive (EU) 2019/771. In particular, this legal guarantee covers rules on the conformity of replaced parts with the contract, remedies in the event of a lack of such conformity, the modalities for the exercise of those remedies, and on commercial guarantees, including the potentially shortened liability or limitation period for second-hand products. Additional commercial guarantees are quite common in the sector and can be provided on top of the legal guarantee, typically already in place due to the competitive advantage it might provide.
- 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)
- **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)

2.5 Manufacture of food products and beverages

2.5.1 The protection and restoration of biodiversity and ecosystems

Description of the activity

Manufacture of food products. The economic activities in this category could be associated with 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 is excluded from the entire scope. Activity 'Processing and preserving of fish, crustaceans and molluscs' classified under NACE code C10.2 is excluded from the scope for Option B. and Option C.

Manufacture of Beverages. The economic activities in this category could be associated with 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

The economic activity complies with one of the following (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 complies 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'), A3.12 ('Freshwater fishing'), or 10.11 ('Processing of fish, crustaceans and molluscs on factory ships or in factories ashore (partial – only covering where processing on factory ships') 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 complies with the following criteria:

- The manufactured food product or beverage consists for at least 20% by weight of protein-rich ingredient(s), and at least 97% by weight of its protein-rich ingredient(s) consist of ingredient(s) that comply with 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);

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.

- The following minimum sourcing and manufacturing requirements are complied with:
    - The food product or beverage consists entirely of ingredients sourced in a way that their production practices comply with the minimum sourcing requirements mentioned in Table 2 (see Supplementary Material section).
    - The food product or beverage manufacturing process complies with the minimum requirements mentioned in Table 2 (see Supplementary Material section).

Added water and cooking salt shall not be taken into account for the above calculations.

C. Selection of ingredients that contribute to conservation and genetic diversity. The economic activity complies with the following criteria:

- At least 50% of the ingredients by weight (excluding added water and cooking salt for determining this share) 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 'substantial contribution to the protection and restoration of biodiversity & ecosystems' for 'Animal production'.
    - If plant-based, 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).

- The following minimum sourcing and manufacturing requirements are complied with:

- The food product or beverage consists entirely of ingredients sourced in a way that their production practices comply with the minimum sourcing requirements mentioned in Table 2 (see Supplementary Material section).
- The food product or beverage is manufacturing in a way entirely of ingredients sourced in way that the manufacturing process complies with the minimum manufacturing requirements mentioned in Table 2 (see Supplementary Material section).

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*'. Data for insects has been retrieved from Santo et al (2020)[469], and data for food products not covered by Poore & Nemecek (2018) or Santo et al (2020), is retrieved from Our World in Data (using food composition factors from the FAO INFOODS International Database and Food Balance Sheets). All comparisons here are based on the global mean value per food product across all studies.

[469] Raychel E. Santo, Brent F Kim, Sarah Goldman, Jan Dutkiewicz, Erin Biehl, Martin William Bloem, Roni Neff, Keeve E Nachman, *Considering Plant-Based Meat Substitutes and Cell-Based Meats: A Public Health and Food Systems Perspective*, Frontiers in Sustainable Food Systems', 2020

Ingredient	Average land use per 100g protein (m^2)
Nuts	**7.9**
Tomatoes	**7.3**
Other Pulses	**7.3**
Poultry Meat	**7.1**
Oatmeal	**5.8**
Eggs	**5.7**
Potatoes	**5.2**
Brassicas	**5.0**
Grains	**4.6**
Rice	**3.9**
Insects	**3.6**
Groundnuts	**3.5**
Peas	**3.4**
Root Vegetables	**3.3**
Wheat & Rye	**3.2**
Maize	**3.1**
Onions & Leeks	**3.0**
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, as follows:

Land Use = Direct Land Use + Indirect Land Use

where *Direct Land Use* is the on-farm area occupied to produce 1 kg of animal product, in m2·year, and Indirect Land Use is calculated using the feed. 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.

- **For Microbial Products**

For microbial products, used here in the broad connotation of bacteria, fungi, yeast and algae, direct and indirect land use are combined into one figure, as follows:

Land Use = Direct Land Use + Indirect Land Use

where *Direct Land Use* is the on-farm area occupied to produce 1 kg of microbial product, in m2·year, and Indirect Land Use is calculated using the "feed", i.e., resource input. For the indirect land use calculation, the land used for feed, should use feed crops / resource type 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.

TABLE 2: Minimum sourcing and manufacturing requirements

Minimum sourcing requirements
The Farm Sustainability Management Plan identifies the management practices or other measures that ensure compliance with the following criteria: • **Habitat loss or conversion:** o The ingredient production activity has not led to the conversion or fragmentation of high-nature-value land, forests, or other lands of high-biodiversity value excluding wetlands since 2008, or at any future date. 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). o The ingredient production 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, floodplains, riparian zones (see below), aquatic (rivers, ponds, springs, etc) and coastal

habitats, since 2008 or at any future date. It is noted that paludiculture activities are permissible, where evidence is provided that production has not and will not involve drainage of previously undrained soil.

- The ingredient production activity will not lead to any further drainage of moist farm areas, such as springs, flushes, water meadows, etc.
- 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):
  - Through either conversion or subsequent production since 2008 or going forward, ingredient production 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
  - Land conversion and production activities are carried out in accordance with the conclusions of an appropriate assessment, where applicable, and necessary mitigation measures63 have been implemented accordingly
- Natural grasslands 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.
- Semi natural grasslands66 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
- 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.

- **Pollution:**
  - On the use of Active Pharmaceutical Ingredients (API):

- Active Pharmaceutical Ingredients (API) used are registered, both for therapeutic and sub-therapeutic uses.
- 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.
- 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.

- **Water:**
  - No new drainage or improved efficiency (e.g., deepening) of existing drainage (e.g., replacement of drainage ditches with underground pipes)
  - Compliance with water abstraction licenses (according to local law)
  - No irrigation of forestry operations – except if necessary for a limited period during seedling establishment phase.
  - No alteration of water bodies (diverting / canalising / damming of rivers, streams, etc.)

Minimum manufacturing requirements

- 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.

TABLE 3: Combined direct and indirect greenhouse gas emissions per kilogram of food product (Source: Poore, J., & Nemecek, T. (2018); Santo et al (2020); Our World in Data)

Greenhouse gas emissions are measured in kilograms of carbon dioxide equivalents ($kgCO_2eq$) per kilogram of food product. This means non-CO_2 greenhouse gases are included and weighted by their relative warming impact. Global total GHG emissions are taken from Emissions Database for Global Atmospheric Research (EDGAR) by JRC.

Ingredient	Average GHG emissions per kilogram of food product ($kgCO_2eq$ / kg)
Beef (beef herd)	**99.5**
Dark Chocolate	**46.7**
Lamb & Mutton	**39.7**
Beef (dairy herd)	**33.3**
Coffee	**28.5**
Prawns (farmed)	**26.9**
Cheese	**23.9**
Fish (farmed)	**13.6**
Pig Meat	**12.3**
Poultry Meat	**9.9**
Eggs	**4.7**
Rice	**4.5**
Groundnuts	**3.2**
Cane Sugar	**3.2**
Tofu (soybeans)	**3.2**
Milk	**3.2**
Insects	**2.6**
Oatmeal	**2.5**
Tomatoes	**2.1**
Beet Sugar	**1.8**
Other Pulses	**1.8**
Wine	**1.8**
Maize	**1.7**
Wheat & Rye	**1.6**
Berries & Grapes	**1.5**
Cassava	**1.3**
Barley	**1.2**
Other Fruit	**1.1**
Peas	**1.0**
Soymilk	**1.0**
Bananas	**0.9**
Other Vegetables	**0.5**

Brassicas	**0.5**
Onions & Leeks	**0.5**
Potatoes	**0.5**
Apples	**0.4**
Nuts	**0.4**
Root Vegetables	**0.4**
Citrus Fruit	**0.4**

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 gCO_2e/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. • The food product or beverage consists for at least 95% by weight (excluding added water and cooking salt for determining this share) of ingredient(s), such that for each of these ingredients the combined direct and indirect lifecycle greenhouse gas emissions are on average $10kgCO_2eq$ per kg of ingredient. This can be verified by either using the values in Table 3 in the Supplementary Material section, or by calculating the value(s) using Commission Recommendation (EU) 2021/2279, or, alternatively, using ISO 14067:2018. • Production activities that yield the food or beverage product's ingredients 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, are not converted. (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 as growing medium (except for paludiculture activities, where evidence is provided showing that production has not and will not involve drainage of previously undrained soil), fertilizer, animal bedding, etc
(2) Climate change adaptation	DNSH as set out in Appendix 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	• 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 requiring a third-party certification, such as ISO 14001, EMAS, or equivalent, 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 [470]. No significant cross-media effects occur. • The primary packaging materials comply with REGULATION (EC) No 1935/2004 on materials and articles intended to come into contact with food. • 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	N/A

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

[470] Industrial Emissions Directive 2010/75/EU (Integrated Pollution Prevention and Control)

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

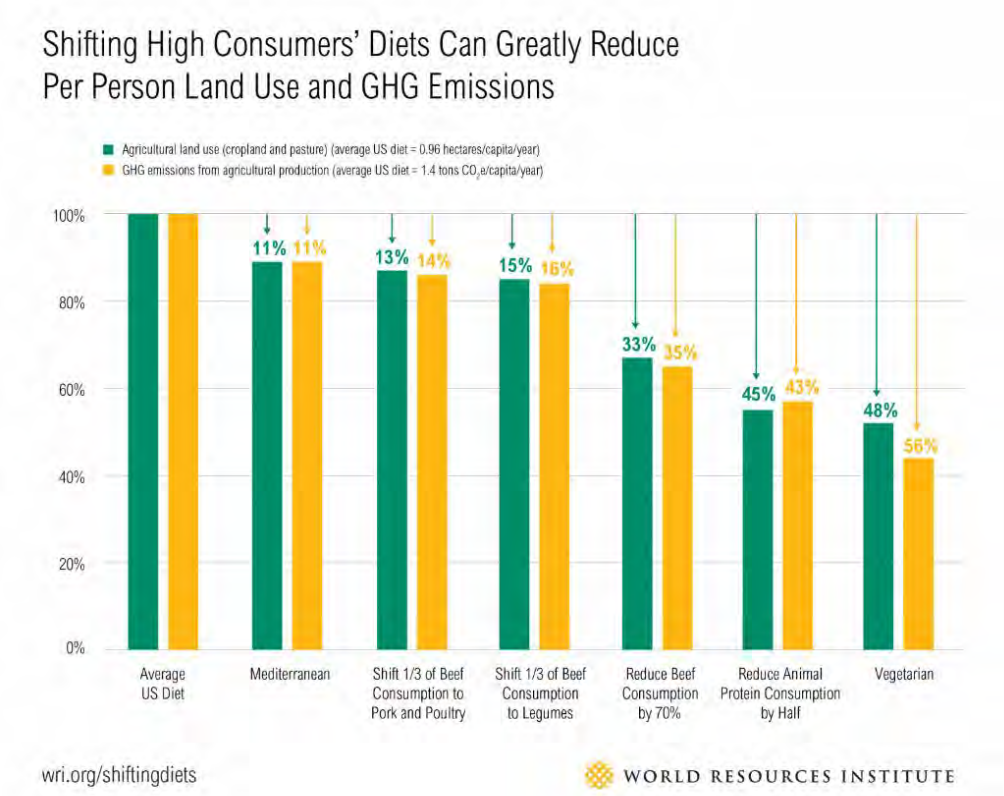
The three criteria focus on ingredient selection by the food & beverage manufacturer as a key driver for substantial contribution to biodiversity.

- **"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 CO_2eq (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)

- "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)*)*
- "**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*.)*
- "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.

- While protein-rich ingredients deliver nutritional value, some of these ingredient categories have a high negative impact 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 part of this criterion ensures the use of protein-rich ingredients, delivering nutritional value, while the second part ensures these protein-rich ingredients have low negative impact on biodiversity as measured through land use. Two options to show this low negative impact on biodiversity 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 (relative to the amount of product protein) 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)
- Note how the use of protein-rich ingredients with high negative impact on biodiversity as measured through land use is allowed in limited quantity to account for specific cases. Overall, there is a limit on such ingredients with high negative impact 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.
- Minimum sourcing and manufacturing requirements have been added to avoid unintended negative impact on biodiversity through sourcing and/or manufacturing. The sourcing requirements have been aligned with the Taxonomy criteria for crop and livestock production (albeit only consisting of a subset).
- 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. So while this economic activity could in principle be included, the development of solid criteria would require substantial research, which was not possible in the current timeframe.
- Similarly, while in principle the criteria could cover cultivated meat, if it complies with the requirement, the criteria have not been developed to accommodate this due to lack of evidence on impact (given the early stage of these products/technologies).

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* –

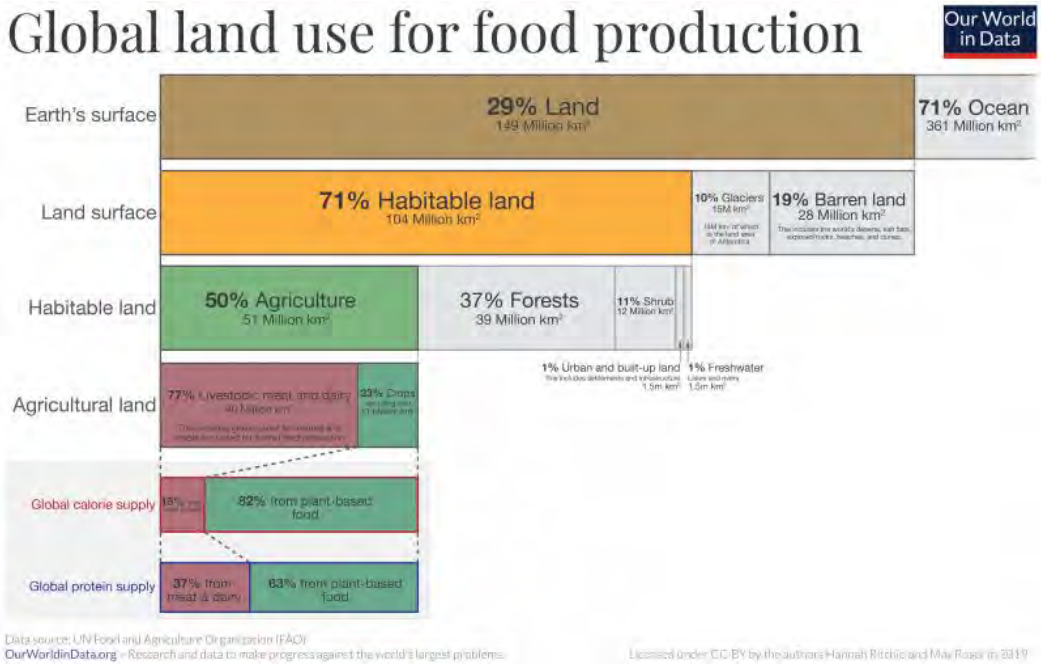
Bending the curve of biodiversity loss. Almond, R.E.A., Grooten M. and Petersen, T. (Eds). WWF, Gland, Switzerland.)

- "**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)
- **The need for grazing land and for arable land to grow animal feed is the single most important driver of deforestation**, with consequences for greenhouse-gas emissions and biodiversity. (*Meat: the Future series – Alternative Proteins*, World Economic Forum & Oxford University (2019))
- **"**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**

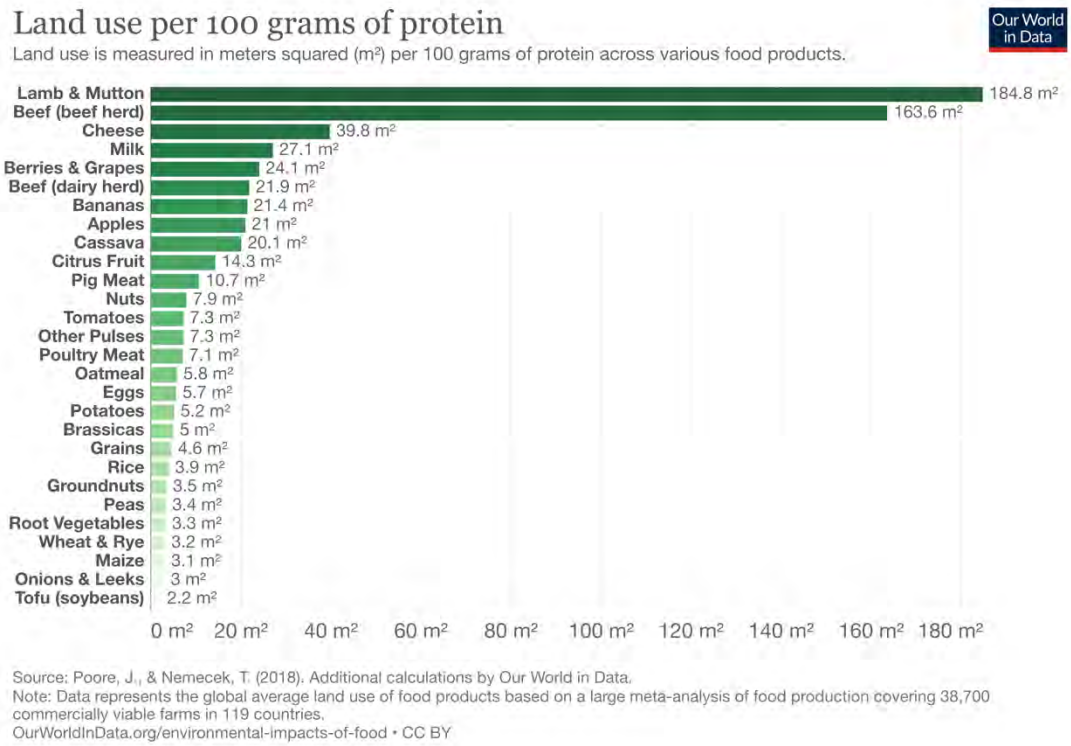
terrestrial biodiversity loss, 80% for soil acidification and air pollution (ammonia and nitrogen oxides emissions), 81% for global warming, and 73% for water pollution (both N and P). […] Expressed in terms of MSA (representing an index of the naturalness of an193cosystemm), we estimated that overall 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 CO_2-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/

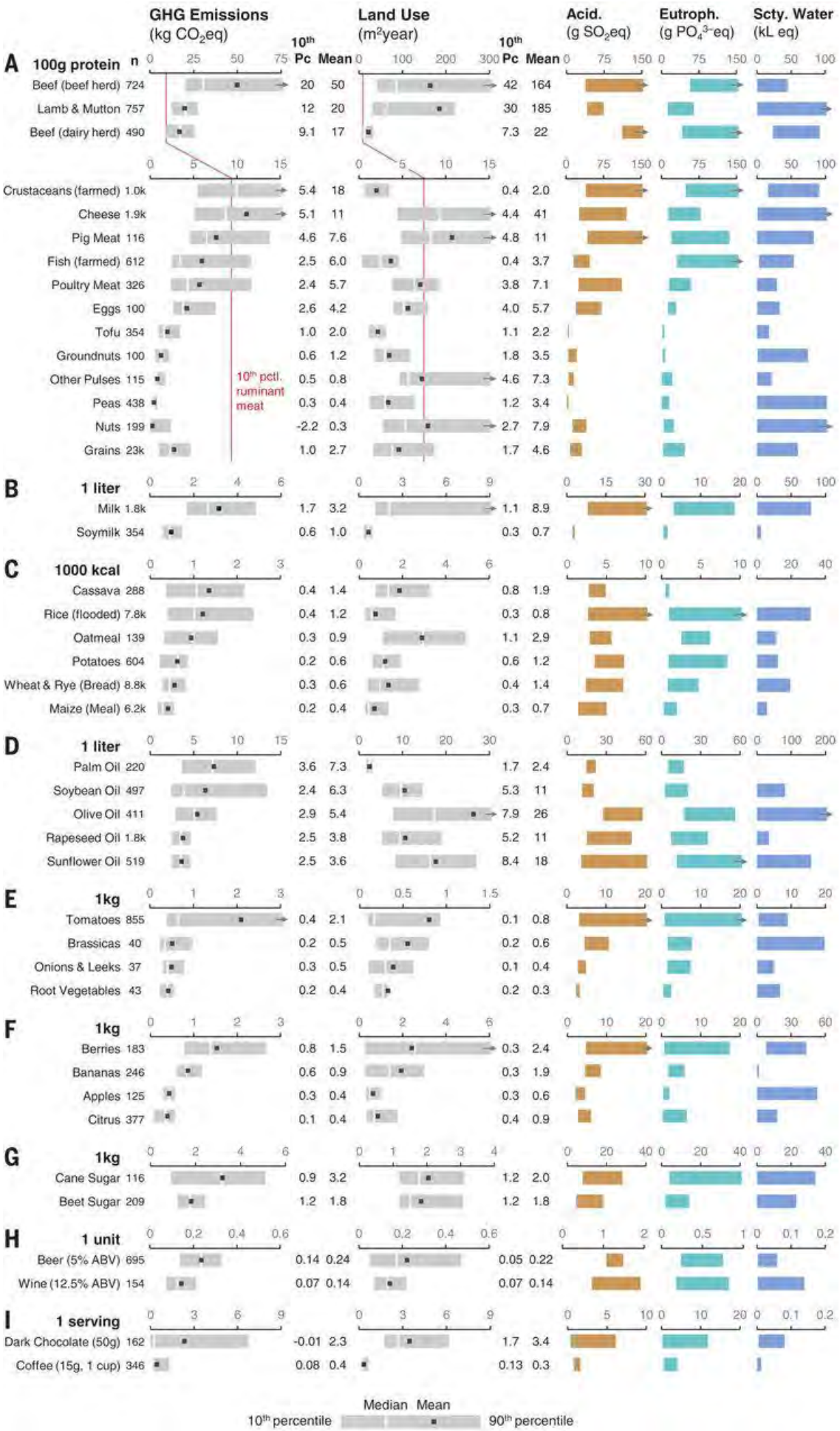
Footprints expressed per kilogram of food product can be converted to per unit protein or kilocalorie using data on the nutrient density of food products. Where nutritional footprints are available from Poore & Nemecek (2018), this data has been used. Where there were gaps, this data has been calculated by Our World in Data. Data for insects has been retrieved from Santo et al (2020)[471] which builds on the work of Poore & Nemecek (2018).

- Overview average land use per 100g protein (m^2) (Source: Poore & Nemecek, 2018; Sante et al (2020); and Our World in Data).

[471] Raychel E. Santo, Brent F Kim, Sarah Goldman, Jan Dutkiewicz, Erin Biehl, Martin William Bloem, Roni Neff, Keeve E Nachman, *Considering Plant-Based Meat Substitutes and Cell-Based Meats: A Public Health and Food Systems Perspective*, Frontiers in Sustainable Food Systems', 2020, https://www.researchgate.net/publication/344000302_Considering_Plant-Based_Meat_Substitutes_and_Cell-Based_Meats_A_Public_Health_and_Food_Systems_Perspective

Ingredient	Average land use per 100g protein (m^2)
Lamb & Mutton	**184.8**
Beef (beef herd)	**163.6**
Dark Chocolate	**137.9**
Cheese	**39.8**
Milk	**27.1**
Coffee	**27.0**
Berries & Grapes	**24.1**
Beef (dairy herd)	**21.9**
Bananas	**21.4**
Apples	**21.0**
Cassava	**20.1**
Citrus Fruit	**14.3**
Pig Meat	**10.7**
Nuts	**7.9**
Tomatoes	**7.3**
Other Pulses	**7.3**
Poultry Meat	**7.1**
Oatmeal	**5.8**
Eggs	**5.7**
Potatoes	**5.2**
Brassicas	**5.0**
Grains	**4.6**
Rice	**3.9**
Insects	**3.6**
Peas	**3.4**
Root Vegetables	**3.3**
Wheat & Rye	**3.2**
Maize	**3.1**
Onions & Leeks	**3.0**
Tofu (soybeans)	**2.2**

- Overview environmental impact across ingredients.

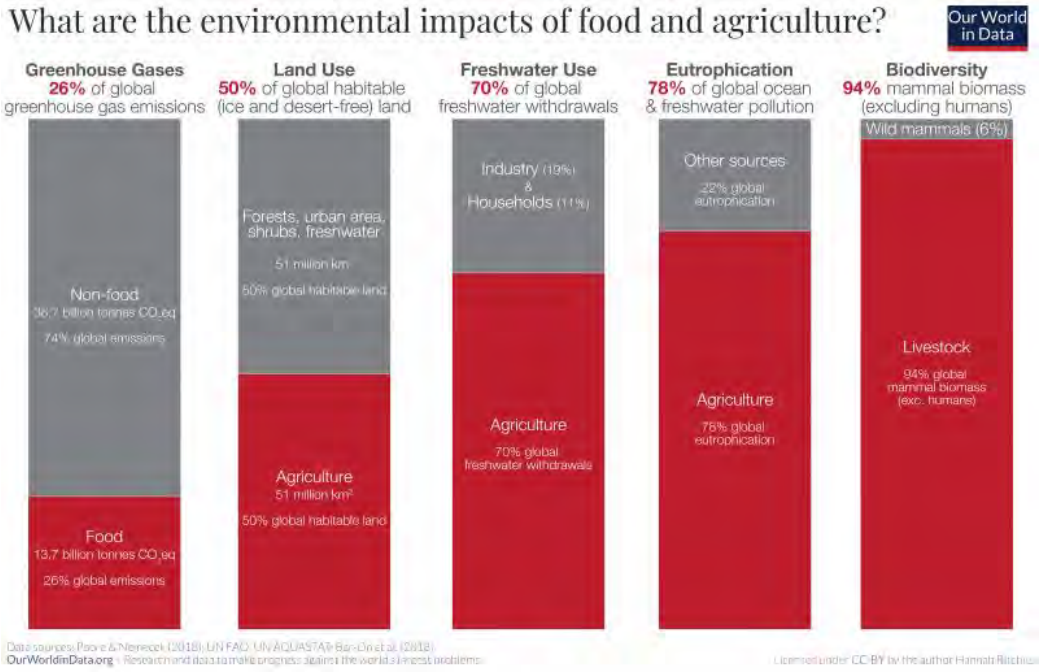

GHG Emissions (kg CO_2eq)
Land Use (m^2year)
Acid. (g SO_2eq)
Eutroph. (g PO_4^{3-}eq)
Scty. Water (kL eq)
10th Pc
Mean
A 100g protein
n
Beef (beef herd) 724 20 50 42 164
Lamb & Mutton 757 12 20 30 185
Beef (dairy herd) 490 9.1 17 7.3 22
Crustaceans (farmed) 1.0k 5.4 18 0.4 2.0
Cheese 1.9k 5.1 11 4.4 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

- Production of mycoprotein through fermentation provides a distinct and relatively benign environmental footprint. These environmental impacts have been quantified through the use of techniques such as lifecycle analysis that conform to international standards and whose conclusions are independently audited and certified by the Carbon Trust. **Comparison of Quorn grounds with beef, for example, show ≥10 times less embedded carbon, land, and water use.** In addition, because mycoprotein is grown with the carbohydrate fraction of crops as the fermentation substrate, **the process can be considered to give rise to an overall net gain in protein**. This is because the original protein from the crops is not used in the fermentation of mycoprotein and is thus conserved. This is unlike many other food protein production systems, most notably animal protein, which result in a net decrease in protein because of their inherent inefficiencies. Thus, as we look at the increasing difficulties of assuring a global sustainable food future, mycoprotein fermentation technology offers an important new tool with which to meet this challenge. (*Mycoprotein: The Future of Nutritious Nonmeat Protein, a Symposium Review*, Tim J A finnigan, Benjamin T Wall, Peter J Wilde, Francis B Stephens, Steve L Taylor, and Marjorie R Freedman, Current Developments in Nutrition, (2019), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6554455/)

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 to 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.

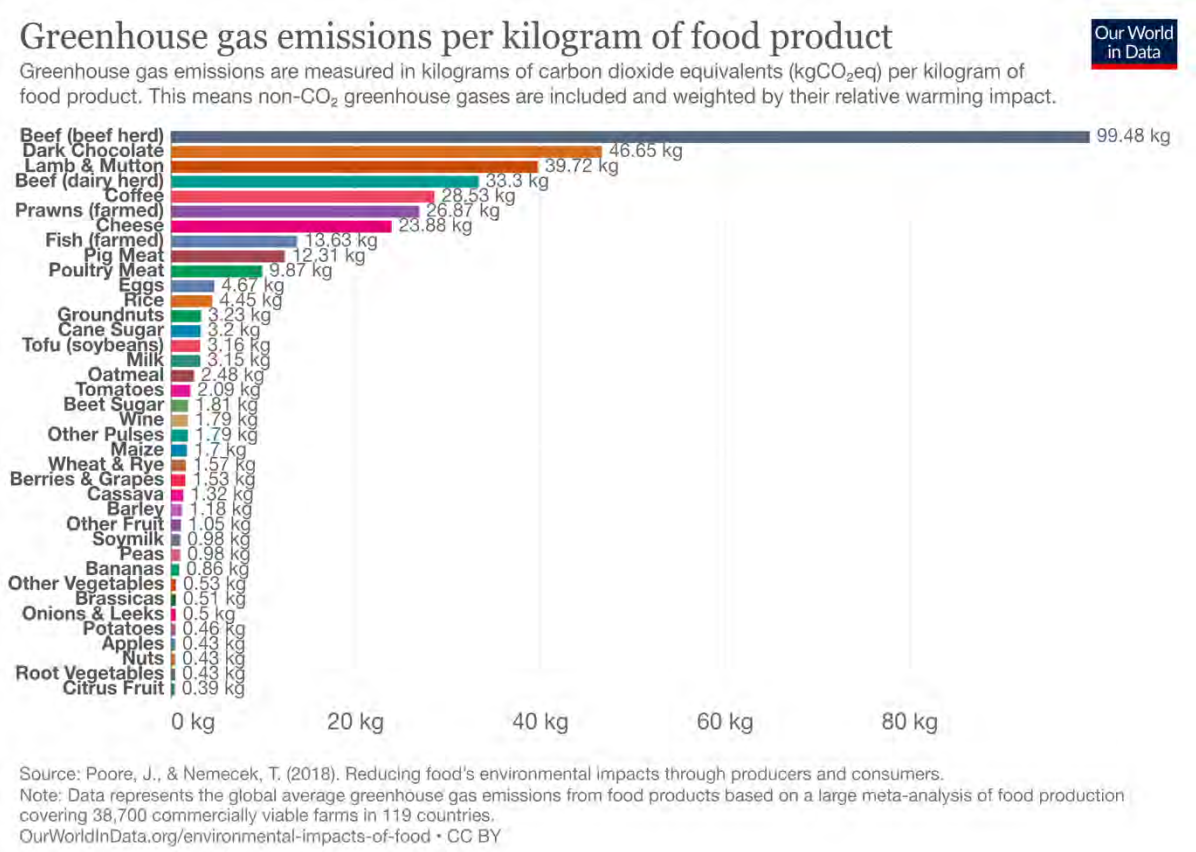


For this option **“**C10.2 Processing and preserving of fish, crustaceans and molluscs” is excluded from the scope, as the argumentation is built on crops and livestock on land. Hence, the rationale and criteria would need to be expanded to ensure substantial contribution in the context of fishing and 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). The current formulation allows for inclusion of high-impact ingredients as long as they occur in low amounts.

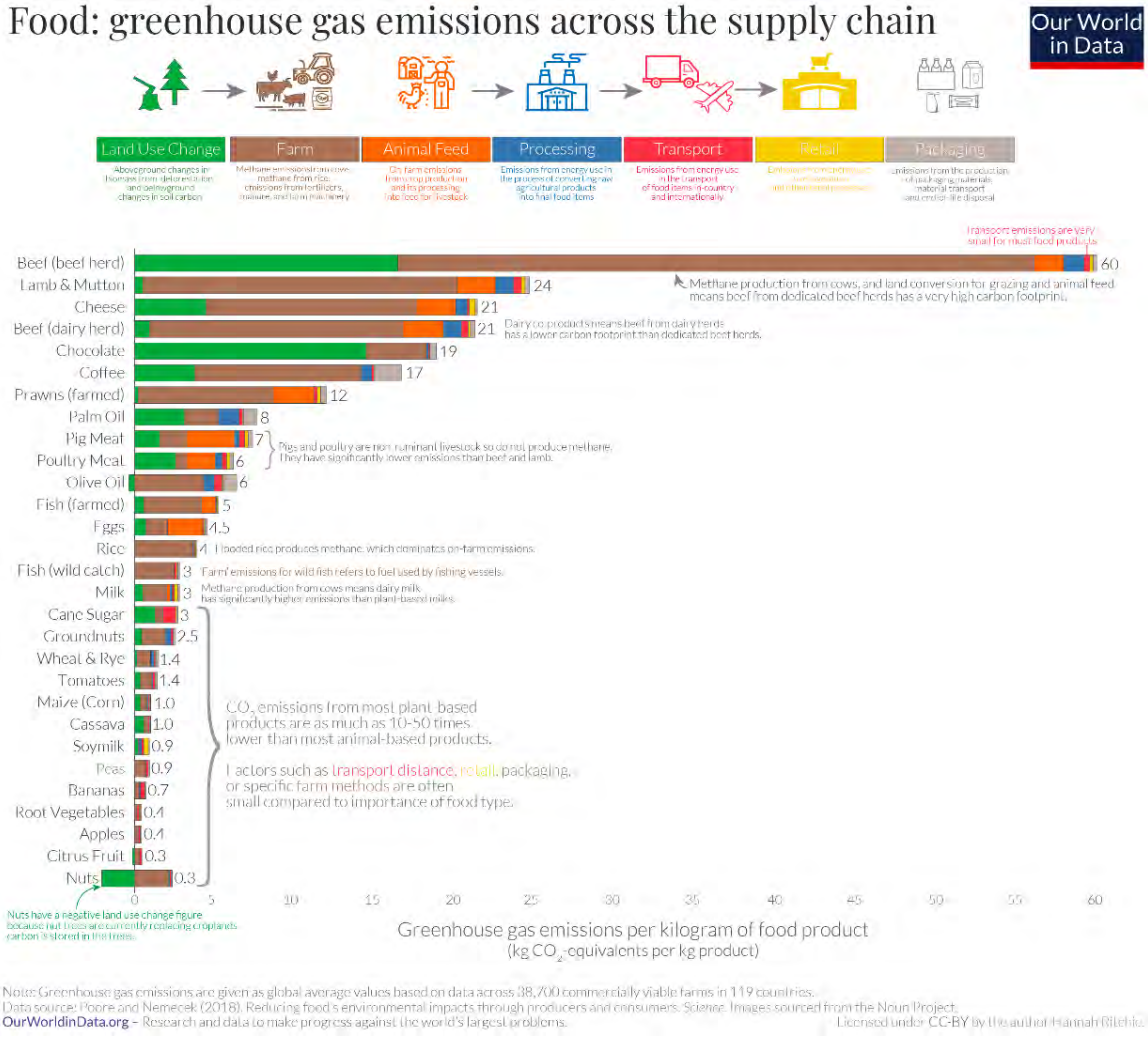


- In addition, high GHG emissions could mitigate the biodiversity improvement gained through limiting land use:
    - “Globally, **climate change** has not been the most important driver of the loss of biodiversity to date, yet in coming decades it **is projected to become as, or more, important than 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).

2.5.2 The transition to a circular economy

Description of the activity

Manufacture of food products. The economic activities in this category could be associated withNACE code C10 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

Manufacture of Beverages. The economic activities in this category could be associated with 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
The economic activity complies with one of the following criteria:

1. The primary food/beverage packaging[472] is kept in the economy through reuse in practice and food/beverage loss & waste is minimised. The activity complies with the three following criteria:

1.1. 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[473].
- 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.

[472] With 'packaging' as defined by EU Directive 94/62/EC

[473] As defined by CEN 13429:2004

- 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.[474]

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).

1.2. 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 (while intended to be collected for industrial treatment); 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, or is proven to be on track 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.

[474] 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.

- 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 100 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.[475] Successful post-consumer collection, sorting, and recycling is on track to work 'in practice and at scale' if the packaging achieves at least a recycling rate that is proportionate to filling the gap between a base year recycling rate and the 2025 target as set by the Directive (EU) 2018/852 (by material, by weight), with achieving the 2025 target from 2025 onwards. For plastics, the achieved post-consumer recycling rate is calculated at polymer level (e.g., PET, PE, PP, HDPE).

- Packaging of which the design allows only for recycling into applications that do not permit any further use-cycles for the same or a similar application cannot be considered 'recyclable packaging' (e.g., plastics-to-roads, packaging-to-textiles). For example, the packaging does not contain additives and colours that contaminate sorting or recycling in practice in a harmful way (e.g., carbon black).

- **Home-compostable packaging:** A packaging or packaging component is home-compostable if it is certified with relevant internationally recognised home-

[475] For all packaging materials, if and when EU targets are formally provided at a more granular level (e.g., PET, PE, PP for plastics; clear glass, green glass for glass), then these targets might replace the material-level ones currently set by Directive (EU) 2018/852 and used in this definition.

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.

1.3. 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 requiring a third-party certification, such as ISO 14001, EMAS, or equivalent, 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.

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2. The primary, secondary and tertiary food/beverage packaging[476] material feedstock choice and design supports recycling, and food loss & waste is minimised. The activity complies with the three following criteria:

2.1. Use of recycled or renewable material: 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 from 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 made using a batch-level mass balance method (such as those in place in Quality Management Systems under ISO 9001 certifications and meeting the provisions of Art. 16 of the Food Contact Materials Regulation (1935/2004)and provided in line with internationally recognised certification systems, such as ISCC PLUS certified packaging.

2.2. 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 (while intended to be collected for industrial treatment); or a combination of these, based on the following definitions:

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[476] With 'packaging' as defined by EU Directive 94/62/EC

- **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, or is proven to be on track 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 100 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.[477] Successful post-consumer collection, sorting, and recycling is on track to work 'in practice and at

[477] For all packaging materials, if and when EU targets are formally provided at a more granular level (e.g., PET, PE, PP for plastics; clear glass, green glass for glass), then these targets might replace the material-level ones currently set by Directive (EU) 2018/852 and used in this definition.

scale' if the packaging achieves at least a recycling rate that is proportionate to filling the gap between a base year recycling rate and the 2025 target as set by the Directive (EU) 2018/852 (by material, by weight), with achieving the 2025 target from 2025 onwards. For plastics, the achieved post-consumer recycling rate is calculated at polymer level (e.g., PET, PE, PP, HDPE).

  - Packaging of which design allows only for recycling into applications that do not permit any further use-cycles for the same or a similar application cannot be considered 'recyclable packaging' (e.g., plastics-to-roads, packaging-to-textiles). For example, the packaging does not contain additives and colours that contaminate sorting or recycling in practice in a harmful way (e.g., carbon black).

- **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.

2.3. 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 requiring a third-party certification, such as ISO 14001, EMAS, or equivalent, 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.

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 the product-relevant parts of the Commission Recommendation 2021/2279 or, alternatively, using ISO 14067:2018. Quantified lifecycle GHG emissions are verified by an independent third party, using ISO 14065:2020, or equivalent. • 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 gCO_2e/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.

	• The food product or beverage consists for at least 95% by weight (excluding added water and cooking salt for determining this share) of ingredient(s), such that for each of these ingredients the combined direct and indirect lifecycle greenhouse gas emissions are on average 10kgCO_2eq per kg of ingredient. This can be verified by either using the values in Table 2 in the Supplementary Material section, or by calculating the value(s) using Commission Recommendation (EU) 2021/2279, or, alternatively, using ISO 14067:2018. • 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, are not converted. (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).

	• No use of peat – e.g., as growing medium, fertilizer, animal bedding, etc. It is noted that paludiculture activities are permissible, where evidence is provided showing that production has not and will not involve drainage of previously undrained soil.
(2) Climate change adaptation	DNSH as set out in Appendix 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	• 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.[478] • 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.[479] • 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[480]. No significant cross-media effects occur. • The primary packaging materials comply with REGULATION (EC) No 1935/2004 on materials and articles intended to come into contact with food.

[478] 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.

[479] Industrial Emissions Directive 2010/75/EU (Integrated Pollution Prevention and Control)

[480] Industrial Emissions Directive 2010/75/EU (Integrated Pollution Prevention and Control)

	• 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/2019-11/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. The food product or beverage consists for at least 95% by weight (excluding added water and cooking salt for determining this share) of ingredient(s) sourced in a way that their production practices comply with the minimum sourcing requirements mentioned in Table 1. Any biomass used for packaging (i.e., renewable feedstock) complies with the sustainability requirements of the EU regulatory framework,

	including Part A of Annex IX of Directive (EU) 2018/2001, 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.

Supplementary Material

TABLE 1: Minimum sourcing requirements Minimum sourcing requirements

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

- **Habitat loss or conversion:**
  - The ingredient production activity has not led to the conversion or fragmentation of high-nature-value land, forests, or other lands of high-biodiversity value excluding wetlands since 2008, or at any future date. 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).
  - The ingredient production 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, floodplains, riparian zones (see below), aquatic (rivers, ponds, springs, etc) and coastal habitats, since 2008 or at any future date.
  - The ingredient production activity will not lead to any further drainage of moist farm areas, such as springs, flushes, water meadows, etc.
  - 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):

        - Through either conversion or subsequent production since 2008 or going forward, ingredient production 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
        - Land conversion and production activities are carried out in accordance with the conclusions of an appropriate assessment, where applicable, and necessary mitigation measures have been implemented accordingly
    - Natural grasslands 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.
    - Semi natural grasslands66 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
    - 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.
- **Pollution:**
    - For farms defined as intensive in the BREF for the Intensive Rearing of Poultry or Pigs3: 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
    - On the use of Active Pharmaceutical Ingredients (API):
        - Active Pharmaceutical Ingredients (API) used are registered, both for therapeutic and sub-therapeutic uses.
        - 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.

- 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.

- **Water:**
  - No new drainage or improved efficiency (e.g., deepening) of existing drainage (e.g., replacement of drainage ditches with underground pipes)
  - Compliance with water abstraction licenses (according to local law)
  - No irrigation of forestry operations – except if necessary for a limited period during seedling establishment phase.
  - No alteration of water bodies (diverting / canalising / damming of rivers, streams, etc.)

TABLE 2: Combined direct and indirect greenhouse gas emissions per kilogram of food product (Source: Poore, J., & Nemecek, T. (2018); Santo et al (2020); Our World in Data)

Greenhouse gas emissions are measured in kilograms of carbon dioxide equivalents ($kgCO_2eq$) per kilogram of food product. This means non-CO_2 greenhouse gases are included and weighted by their relative warming impact. Global total GHG emissions are taken from Emissions Database for Global Atmospheric Research (EDGAR) by JRC.

Ingredient	Average GHG emissions per kilogram of food product ($kgCO_2eq$ / kg)
Beef (beef herd)	**99.5**
Dark Chocolate	**46.7**
Lamb & Mutton	**39.7**
Beef (dairy herd)	**33.3**
Coffee	**28.5**
Prawns (farmed)	**26.9**
Cheese	**23.9**
Fish (farmed)	**13.6**
Pig Meat	**12.3**
Poultry Meat	**9.9**
Eggs	**4.7**
Rice	**4.5**

Groundnuts	**3.2**
Cane Sugar	**3.2**
Tofu (soybeans)	**3.2**
Milk	**3.2**
Insects	**2.6**
Oatmeal	**2.5**
Tomatoes	**2.1**
Beet Sugar	**1.8**
Other Pulses	**1.8**
Wine	**1.8**
Maize	**1.7**
Wheat & Rye	**1.6**
Berries & Grapes	**1.5**
Cassava	**1.3**
Barley	**1.2**
Other Fruit	**1.1**
Peas	**1.0**
Soymilk	**1.0**
Bananas	**0.9**
Other Vegetables	**0.5**
Brassicas	**0.5**
Onions & Leeks	**0.5**
Potatoes	**0.5**
Apples	**0.4**
Nuts	**0.4**
Root Vegetables	**0.4**
Citrus Fruit	**0.4**

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, as defined by Directive 94/62/EC, 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.* As packaging

has a role to play in decreasing food loss and waste, the two categories of criteria are closely linked. Causality of this link is not always clear, so nuance is needed (e.g., IEEP report[481] on single-use plastics & food waste)

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)[482], ISO standards (e.g., 14021, 18601), US FT Green Guides and other relevant expert bodies

1. The primary food/beverage packaging is kept in the economy through reuse in practice and food/beverage 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*". The European Parliament has called for an increase in the share of reuse to 10% by 2030.

1.1. Design for reuse in practice

[481] J.-P. Schweitzer, S. Gionfra, M. Pantzar, D. Mottershead, E. Watkins, F. Petsinaris, P. ten Brink, E. Ptak, C. Lacey and C. Janssens (2018) *Unwrapped: How throwaway plastic is failing to solve Europe's food waste problem (and what we need to do instead)*. Institute for European Environmental Policy (IEEP), Brussels. https://ieep.eu/publications/plastic-packaging-and-food-waste-new-perspectives-on-a-dual-sustainability-crisis

[482] https://www.newplasticseconomy.org/assets/doc/Global-Commitment_Definitions_2020-1.pdf

- 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 substantial contribution 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 the B2C nature (i.e., complexity in the 'final mile' involving interactions with citizens), involving possible fundamental change of the delivery model (e.g., implement reuse system, move to bulk selling). Hence, this is part where most impact can be achieved. If one were to require reuse for secondary and tertiary packaging too, then not succeeding in doing so would immediately remove the incentive for making primary packaging reusable, which is the single most impactful leverage point in this context. Also, reuse in B2B setting is already used to certain extent (e.g., pallets, crates, drums), In addition, 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, metal drums), which makes the potential added value limited, balancing with the risk described in the previous sentence. Recycling is the minimum bar for keeping materials in the economy (with the potential for substantial contribution if sufficiently ambitious), which explains why the packaging aspects in Option B are covering primary, secondary and tertiary packaging. 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:
  - The minimum number of trips/rotations aims to ensure that a working reuse system either already exists in the market on which the packaging is being put, or a similar system has shown to work elsewhere. As the key barrier to reuse is to make reverse logistics work, once a packaging reuse system has been put in place successfully, it is likely to go beyond a small fixed number of cycles, and thus achieve materials savings. Note that the minimum number has not been chosen to be perfectly aligned with the environmental break-even point for the numerous 'material x application x region x environmental indicators' combinations that exist today, as these can vary widely depending on the context). Rather, next to showing that the reuse system

works, it aims to ensure a minimum level of materials savings and environmental benefits (see next bullets).

- 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)).[483]
- OPRL Refill Labels Offer Consumer Reassurance on Reusable Packaging have been launched in April 2021. Building on OPRL's 12 year track record of evidence-led and rigorous recyclability labelling, it is extending the same ISO 14021-compliant approach to reusable packaging with its Refill range. OPRL's underpinning Rules will ensure real environmental benefits by mandating [484][485]
- 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))
- Sensitivity analysis showed that glass bottles (0.75l) can be environmentally equivalent to aluminium cans and PET bottles (0.5 l) after reusing three times (United Nations Environment Programme (2020). *Single-use plastic bottles and their alternatives. Recommendations from Life Cycle Assessments*).
- A range of reuse examples, both large corporates and SMEs, can be found here: https://plastics.ellenmacarthurfoundation.org/upstream

1.2. 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).

[483] 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/

[485] https://www.oprl.org.uk/wp-content/uploads/2021/04/OPRL-Launches-Refillable-Packaging-Labels.pdf ; https://www.foodservicefootprint.com/new-refill-labels-launched/

- Design for recycling: “A package is recyclable if its main packaging components, together representing at least 95% of the entire packaging weight, are recyclable" does not imply a recycling rate of 95%. Losses can occur during collection, sorting and recycling. Rather this criterion aims to ensure that packaging has been design for recycling.
- 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 100 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. For plastics, the achieved post-consumer recycling rate is calculated at polymer level (e.g., PET, PE, PP, HDPE). If and when EU targets are formally provided at a more granular level, then these targets replace the material-level ones currently used in this definition. For all packaging materials, if and when EU targets are formally provided at a more granular level (e.g., PET, PE, PP for plastics; clear glass, green glass for glass), then these targets might replace the material-level ones currently set by Directive (EU) 2018/852 and used in this definition.
- The inclusion of 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. In particular, the intended after-use pathway is collection of the packaging and nutrient contamination as part of the organic waste stream and further industrial treatment through a waste management infrastructure (e.g., industrial composting or anaerobic digestion). The more stringent home-compostability has been required for regions in which the infrastructure is still being built or in which adequate home-composting is in place. Nevertheless, collection and industrial processing is the intended option.
- When focusing on plastic packaging, the suggested approach is in line with the Global Commitment, led by the Ellen MacArthur Foundation in collaboration with the UN Environment Programme. The Global Commitment has united more than 500 organisations behind a common vision of a circular economy for plastics. Companies representing 20% of all plastic packaging produced globally have committed to ambitious 2025 targets. Food & Beverage manufacturers include The Coca-Cola Company, Diageo, Danone, Ferrero, Kellogg Company, Unilever, etc (see https://ellenmacarthurfoundation.org/global-commitment/signatory-reports for a list, including most recent performance data against these definitions across their product portfolio).

1.3. 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.[486]
- 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.[487]
- 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. 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*".

2.1. Recycled or renewable material

- 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.

[486] 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

[487] See, e.g., https://www.fooddive.com/news/nearly-200-companies-pledge-to-halve-food-waste-by-2030/585873/

- 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 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.

Signalling this importance, the post-consumer part is often the largest volume and the focus of reporting: look e.g., for plastics at the Single-Use Plastics Directive (EU) 2019/904 (Article 13 '*data on the post-consumption waste of single-use plastic products'),* and PlasticsEurope's Plastics - The Facts 2020 (p30).

This furthermore allows to align with EU legislation & initiatives, including the Single-Use Plastics Directive (EU) 2019/904 aims to tackle environmental damage from "*commonly used fast-moving consumer products that are discarded after having been used once for the purpose for which they were provided"* (Recital 5)*,* so focusing on post-consumer. EU Circular Plastics Alliance - Guidance on Waste Definitions (Sep 2021), p26 in the 'Packaging WG: use of recycled plastics' section: "*It is assumed that the amount of pre-consumer waste will not increase significantly as production waste is limited. The growth must come from post-consumer recyclates.*".

In addition, this is aligned with EU and internationally recognised type 1 ecolabels as exclusion of pre-consumer waste in the recycled content calculation is in line with the requirements in EU C(2021) 7500 final*,* ANNEX I: EU Ecolabel criteria for awarding the EU Ecolabel to cosmetic products: "*The applicant shall provide a signed declaration from the packaging manufacturer for the content of postconsumer recycled material or material from renewable origin in the packaging […] The applicant shall provide third party verification and traceability for postconsumer recycled content."*)The Blue Angel, Products made from Recycled Plastics, DE-UZ 30a: *"The applicant shall submit a certificate (including report) pursuant to the EuCertPlast certification scheme (including a calculated and plausibility-checked verification of the post-consumer percentage) to verify the origin and composition of the PCR materials used."*Its

feasibility has been shown by existing practices, such as Magnum's rPP ice cream tub: PlasticsEurope and PackagingWorld.

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, and thus allows to make this distinction in a standardised way Of course, pre-consumer recycled content can be included too, but it won't count towards meeting the target.

- '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. This includes an understanding of the impact on soil health, water and biodiversity. The rate of regeneration of natural capital (e.g., soil) should at least be equal to the depletion rate.
- 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. See, for example Unilever's Lipton Ice Tea bottle[488] or Magnum's rPP ice cream tub: PlasticsEurope and PackagingWorld.
- 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.[489]
- 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),

[488] https://business-review.eu/greenrestart/lipton-brings-innovation-in-the-ice-tea-category-and-introduces-the-bottle-made-of-100-recycled-and-recyclable-plastic-213806

[489] 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)

extended producer responsibility (Article 8), and awareness raising measures (Article 10), and there will be a 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. Batch-level traceability is a common practice in this type of industry. Indeed, traceability is an integral feature of most Quality Management Systems, as certified under ISO 9001. This means that in order to deal with quality complaints from customers, producers have to be able to identify a non-conforming item, and trace its ingredients to the exact quantities and batch numbers of ingredients. For this reason, differentiation between recycled and virgin input in any single batch is information that already exists in any such company. Many B2B customers would not buy from a supplier unable to trace ingredients, so certainly the “better” companies qualifying for the taxonomy will know how to ensure quality control and traceability. More specifically for ST5, food contact materials are subject to a more stringent legal regime. Art. 17 of the Food Contact Materials Regulation (1935/2004) has been in place for almost two decades now and it would be difficult to imagine meeting the legal minimum level at anything but batch level control. As such, this criterion is merely stating control of recycled material at a level guaranteed by the legal minimum (irrespective of the presence or absence of recycled content). Note that the term ‘batch-level mass balance method’ is not used everywhere, and different terms might be in place. This is fine assuming the above requirements are properly covered.

2.2. Design for recycling in practice

See 1.2 above

2.3. Food/beverage loss & waste reduction:

See 1.3 above

2.6 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:

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), other environmental management systems recognized in accordance with Regulation EC 1221/2009 article 45 (such as Eco-Lighthouse), 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;

    - Description of relevant measures applied to minimise the generation of waste, to optimise the reuse, regeneration, recycling and/or recovery of waste and to ensure the proper collection, storage and safe disposal of hazardous and non-hazardous wastes;
    - 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 one of the following criteria:

- Finishing processes for textile products certified by the 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.

- 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 chemical inputs and outputs mentioned above:
    - 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.
    - Dyes and textile auxiliaries do not contain any substances which are identified as SVHCs 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.
    - Dyes and textile auxiliaries comply with the limit values in Chapter 1 of the ZDHC Manufacturing Restricted Substance List (MRSL), Version 2.0.[490]
    - 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.
    - The use of perfluorinated and polyfluorinated chemicals (PFCs) is not permitted.
    - 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.

[490] https://mrsl.roadmaptozero.com/

- 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.

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 substances 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:

- 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)[491] or STeP by OEKO-TEX® Edition 01.2021 or newer (Annex 5: Limit value for wastewater effluents - advanced levels).[492]
- 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 all of the following:

- 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.
- The averaging period requires a 24-hour composite sample. In the case of batch discharge: average values over the release duration taken as flow-proportional

[491] https://www.roadmaptozero.com/post/updated-zdhc-wastewater-guidelines-v1-1-released

[492] https://www.oeko-tex.com/en/our-standards/step-by-oeko-tex

composite samples, or provided that the effluent is appropriately mixed and homogeneous, a spot sample taken before discharge.

- 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.

- 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

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

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
- 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

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 with long lasting effects • H412 - Harmful to aquatic life with long lasting effects • H413 - May cause long lasting harmful effects to aquatic life	The recipes must be formulated using automatic metering systems and the process must follow standard operating procedures. H317 (1B) substances added to the recipe must not have a higher concentration than 0.1% by mass in the final product.
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	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

	with long lasting effects ● H413 - May cause long lasting effects to aquatic life	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.
Pigments	H351 - Suspected of causing cancer	Titanium dioxide may be used as a white pigment in all applications in scope.

Supplementary Material-3 section: Biodegradability of auxiliaries and finishing agents for fibres and yarns

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

Taking into account 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)

Parameter	Unit	Threshold value (Qualified random sample or 2-hour composite sample) (1)
AOX (Adsorbable Organically bound halogen)	mg/l	0.5
COD or TOC	mg/l	80 30
HOI (Hydrocarbon Oil Index)	mg/l	2
Sb	mg/l	0.05
Cr	mg/l	0.05
Cu	mg/l	0.25
Ni	mg/l	0.2
Zn	mg/l	0.5
S^{2-}	mg/l	1
Total N	mg/l	10
Total P	mg/l	0.5
TSS	mg/l	15
pH		6-9
BOD5	mg/l	15
Coliform	Bacteria/ ml	100

(1) the case of batch discharge, average values over the release duration taken as flow-proportional composite samples, or, provided that the effluent is appropriately mixed and homogeneous, a spot sample taken before discharge.

Supplementary Material-5 section: Thresholds for the quality of indirect water discharge

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).

Parameter	Unit	Threshold value (Qualified random sample or 2-hour composite sample) (1)
AOX (Adsorbable Organically bound halogen)	mg/l	0.5

HOI (Hydrocarbon Oil Index)	mg/l	2
Sb	mg/l	0.05
Cr	mg/l	0.05
Cu	mg/l	0.25
Ni	mg/l	0.2
Zn	mg/l	0.5
S^{2-}	mg/l	1

(1) the case of batch discharge, average values over the release duration taken as flow-proportional composite samples, or, provided that the effluent is appropriately mixed and homogeneous, a spot sample taken before discharge.

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 270g CO_2e/kWh.
(2) Climate change adaptation	DNSH as set out in Appendix 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	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. In all other cases, the economic activity complies with all of the following criteria: • 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 targets, 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 use is measured through a verifiable self-assessed mechanism, and water efficiency targets are aligned with the priority risks of the water source. The risks related to water scarcity and water stress in the concerned area are assessed using existing global datasets or risk-based tools.493 • 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. • The water management plan and the water audits may be integrated and documented in the overall water management plan or environmental management system (EMS) of a larger industrial site (e.g., cluster of textile plants). Sustainable levels of water abstraction are subject to a permit in accordance with the Directive 2000/60/EC or national legislation.
(4) Transition to a circular economy	The activity assesses availability of and adopts techniques that support: (a) reuse of products and components, and use of secondary raw materials, including re-used or recycled water and chemicals in the textile finishing process

493 https://www.wri.org/data/aqueduct-global-maps-21-data
https://waterriskfilter.org/explore/map

	(b) design for longevity, sharing, repair, reuse, repurposing, disassembly, remanufacturing, and recycling of textiles (c) waste management that prioritises prevention and preparing for reuse and for recycling over incineration and disposal of waste in the textile finishing process (d) information on and traceability of chemical content and material composition throughout the lifecycle of the finished textiles
(6) Protection and restoration of biodiversity and ecosystems	As set out in Appendix D Generic criteria for DNSH to protection and restoration of biodiversity and ecosystems in Annex I of Commission Delegated Regulation (EU) 2021/2139 of 4 June 2021 supplementing Regulation (EU) 2020/852

Rationale

Description of the activity

- Pollutant emissions can occur across the entire textiles 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 EU Sustainable Finance platform.

- Emissions into air and soil are considered to be 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 which require 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 environmental 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. Depending on potential new regulatory requirements on substances of concern under the EU Chemicals Strategy for Sustainability, and future revisions of relevant ISO type 1 ecolabels as well as the ZHDC RSL list, this criterion should be reviewed and updated accordingly.

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 recommendations from the latest version of the EU Best Available Techniques (BAT) Reference Document for the Textiles Industry Textile BREF.

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 pre-treatment (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 the finishing stage.

- Additional criteria on substantial contribution to prevent and control of microfiber pollution will have to be formulated across the textile value chain e.g., 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.

- Microfiber release should be considered in the future work of the EU Sustainable Finance platform regarding additional taxonomy criteria both at SC and DNSH levels for pollution prevention and control with relevance for a range of economic activities.

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.

2.7 Wearing apparel, except articles of fur and leather: manufacturing, repairing/refurbishing/remanufacturing and sale of spare parts, sale of second-hand, product-as-a-service and other circular use- and result-oriented service models

Description of the activity

Different types of economic activities related to wearing apparel are within scope:

1. **Manufacture of new wearing apparel**: This includes all tailoring (ready-to-wear or made-to-measure), in all materials except fur and leather (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 C14.1 and C14.3, excluding leather clothes classified under NACE code C14.11, in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

2. **Repair, refurbishment and remanufacturing of wearing apparel**:

    - 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 C14.1 and C14.3, excluding leather clothes classified under NACE code 14.11, in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006. 'Repair' means the process of returning a defect product to a condition where it can fulfil its intended use.

    - Refurbishment and remanufacturing of used, out-dated or no longer functional wearing apparel within the defined scope of NACE code C14.1 and C14.3, excluding leather clothes classified under NACE code 14.11. Refurbishment 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. In the case of remanufacturing the product is restored

to the original as-new condition and performance or better. [494] When wearing apparel is refurbished or remanufactured, it is disassembled to the component level and rebuilt, replacing components where necessary to improve the condition and level of performance.

3. **Sale of wearing apparel**: 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 C14.1 and C14.3, excluding leather clothes classified under NACE code 14.11. They are classified under following NACE codes, in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006:

    - G46 Wholesale trade, except of motor vehicles and motorcycles
    - G47 Retail trade, except of motor vehicles and motorcycles

4. **The scope also includes economic activities that provides customers (household or organisation) with access to wearing apparel through service models**, with limitations to products within the scope of NACE codes C14.1 and C14.3, but excluding leather clothes classified under NACE code 14.11.

    These service models can be:

    - Either use-oriented services, where the product is still central, but its ownership remains with the provider and the product is leased, shared, rented or pooled.
    - Or result-oriented, where payment is by pre-defined and agreed result, i.e., pay per service unit delivered.

[494] 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?

Substantial contribution to transition to a circular economy

To contribute substantially to the circular economy, the economic activity in scope complies with at least one of the following A, B, C or D: (*Note that there can be overlaps between the economic activities covered by the different criteria sets, as these are not mutually exclusive.*)

A. Design and manufacturing of new wearing apparel

The economic activity includes manufacture of wearing apparel that complies with all the following criteria A.1 to A.4:

A.1 Design for longevity and reuse

The activity complies with one of the following:

- The manufacture of wearing apparel products certified by the EU Ecolabel for textile products (2014/350/EU)[495], the Blue Angel Ecolabel for textiles (DE-UZ 154)[496], or another internationally recognised ISO type 1 ecolabel that contains equivalent durability requirements, are compliant with A.1. Once the European Commission approved the EU Product Environmental Footprint Category Rules (PEFCR) for Apparel and Footwear[497], the manufacture of wearing apparel products that are covered by the detailed requirements regarding intrinsic quality in Annex 5 of the PEFCR document and that meet the performance criteria for the relevant product category at least at the moderate level are considered as compliant with A.1.

- The manufactured wearing apparel meets all the following durability requirements identified below. For each distinct product design reports from tests carried out in accordance with the standards specified below are provided. The reports verify that each product type or model meets the specified durability requirements.

[495] http://ec.europa.eu/ecat/category/en/14/textile-products

[496] https://www.blauer-engel.de/en/products/home-living/textiles/clothing

[497] For more information on the EU Environmental Footprint transition phase: https://ec.europa.eu/environment/eussd/smgp/ef_transition.htm. PEFCRs will be approved if they meet the requirements set out in this EC guidance document: https://eplca.jrc.ec.europa.eu/permalink/PEFCR_guidance_v6.3-2.pdf

Dimensional changes during washing and drying

The activity complies with the following:

- 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 — Wool mix — Synthetic fibres	± 3,0 % ± 2,0 % ± 2,0 %
Socks and hosiery	± 8,0 %

- This criterion does not apply to:
    - fibres or yarn;
    - 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 if applicable.
- 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.

Colour fastness to washing

The activity complies with the following:

- 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 activity complies with the following:

- 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, or to products that are neither dyed nor printed. 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 activity complies with the following:

- 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 activity complies with the following:

- 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

The activity complies with the following:

- 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

The activity complies with the following:

- 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

The activity complies with the following:

- 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.
- 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.
- 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 ISO 4920 for water repellents.

A.2 Design for recycling

Considering the limitations of currently available recycling practices and technologies for used wearing apparel, the economic activity prioritises fibre blends and product constructions that can be recycled into new wearing apparel in practice today. To strengthen the economic viability of such operations, any additional component or material added to the fabric that is not made of textile fibres (e.g., buttons, zippers, accessories, information carriers) are easily removable without damaging the item and allowing for its reuse or recycling.

In the case of wearing apparel containing predominantly cellulose-based fibres[498], the fraction of cellulose-based fibres needs to amount to at least 90% by weight. The presence of a second fibre type is therefore limited to a maximum of 10% by weight, with the exception of elastane, where the threshold is at 2% by weight. Manufacture of wearing apparel does not comply with this criterion if there are more than two different fibre types present in the fabric.

[498] Cellulose-based fibres refer to those obtained from plant-based material. This material can be either directly captured from plants, such as cotton, or treated chemically to extract and process cellulose (Ellen MacArthur Foundation 2017: A New Textiles Economy). Cellulose-based fibres include, but are not limited to: cotton, hemp, linen, lyocell, modal, and viscose.

In the case of wearing apparel containing predominantly protein-based fibres[499], the fraction of protein-based fibres needs to amount to at least 98% by weight. The presence of a second fibre type is therefore limited to a maximum of 2% by weight. Manufacture of wearing apparel does not comply with this criterion if there are more than two different fibre types present in the fabric.

In the case of wearing apparel containing predominantly synthetic fibres[500], mono-material fabrics made of polyester or polyamide are compliant. The presence of a second fibre type is only compliant in the case of elastane, where any additional share of elastane cannot exceed 2 % of the total fibre composition in weight.

A.3 Restriction of hazardous chemicals, and biodegradability of auxiliaries and finishing agents for fibres and yarns

The activity complies with one of the following:

- The manufacture of wearing apparel products certified by the EU Ecolabel for textile products (2014/350/EU)501, the Blue Angel Ecolabel for textiles (DE-UZ 154)502, or another internationally recognised ISO type 1 ecolabel that contains equivalent requirements for the restriction of hazardous chemicals and the biodegradability of auxiliaries and finishing agents for fibres and yarns, are compliant with A.3.

- The manufacture of wearing apparel meets the following requirements:

    - The final product does not contain the substances listed in the subsection A.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

[499] Protein-based fibres refer to those from animal sources, such as wool and silk (Ellen MacArthur Foundation 2017: A New Textiles Economy)

[500] Synthetic fibres are often referred to as plastic-based fibres including but not limited to polyester, nylon, acrylic, and elastane

[501] http://ec.europa.eu/ecat/category/en/14/textile-products

[502] https://www.blauer-engel.de/en/products/home-living/textiles/clothing

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, bioeliminable 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 A.3.2.

- The use of biocides in components of footwear and leather goods, and in the final product in order to impart biocidal properties is not permitted. Biocidal active substances used for in-can preservation approved for product type 6 and biocidal active substances to protect raw hides and tanned semi-finished products (wet blue, wet white) during storage and transportation approved for product group 9 according to the EU Biocidal Products Regulation (EU/528/2012)[503] are exempted.

- The use of perfluorinated and polyfluorinated chemicals (PFCs), and the use of flame retardants in the finishing of textiles is not.

- Dyes and textile auxiliaries comply with the limit values in Chapter 1 of the ZDHC Manufacturing Restricted Substance List (MRSL), Version 2.0.[504]

Subsection A.3.1:

(a) *Restrictions applying to all production stages*

Substances of Very High Concern (SVHC's)

[503] https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32012R0528&from=EN

[504] https://mrsl.roadmaptozero.com/

(i) Substances meeting the criteria in Art. 57 Applicability All products.	Substances meeting the criteria of Article 57 of that Regulation 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.	N/A	Verification: Declaration of compliance by each production stage and their chemical suppliers.
(ii) Substances restricted under REACH	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 (5), except where there is full compliance with the conditions specified in that Annex;	N/A	Verification: Declaration of compliance by each production stage and their chemical suppliers.
Detergents, surfactants, softeners and complexing agents			
(iil) 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: o readily biodegradable under aerobic conditions, or o inherently biodegradable, and/or o eliminable in wastewater treatment plants. The latest revision of the detergents ingredients database should be used as a reference point for biodegradability:	N/A	Verification: Declaration chemical supplier supported by SDS and/or OECD or ISO test results Test method: See sizing and spinning agents (subsection B.3.1 (a) i/ii)

	http://ec.europa.eu/environment/ecolabel/documents/did_list/didlist_part_a_en.pdf		
(iv) 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			
(v) 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		Verification: Final product testing Test method:

	Polyoxyethylated nonyl phenol Polyoxyethylated p-nonyl phenol		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*

The activity complies with one of the following:

- Wearing apparel meeting the requirements of one of the following Restricted Substance Lists (RSL) are considered to be compliant with criterion A3.1(b):

- EU Ecolabel for textile products (2014/350/EU)[505]
- Blue Angel Ecolabel for textiles (DE-UZ 154)[506]
- Apparel & Footwear International RSL Working Group (AFIRM) Version 6 (2021)[507]
- STANDARD 100 by OEKO-TEX Edition 03.2021[508]
- or an equivalent RSL covering at least the following groups of substances with comparable content limits for:
  - Chlorinated benzenes and toluenes
  - Chlorophenols
  - Dimethylformamide, dimethylacetamide amd N-methylpyrrolidone
  - Dyes
  - Extractable heavy metals
  - Formaldehyde
  - Nickel and its compounds
  - Organotin compounds
  - Phthalates and plasticisers
  - Polycyclic aromatic hydrocarbons

- All the following restrictions applying to the final product are met:

(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	

[505] http://ec.europa.eu/ecat/category/en/14/textile-products : RSL is mentioned in Article 13 and can be found in Appendix 1

[506] https://www.blauer-engel.de/en/products/home-living/textiles/clothing

[507] https://afirm-group.com/afirm-rsl/

[508] https://www.oeko-tex.com/importedmedia/downloadfiles/STANDARD_100_by_OEKO-TEX_R__-_Standard_zh-hans.pdf

	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 not allowed: ▪ Chlorophenols (their salts and esters) ▪ Polychlorinated biphenyls (PCB) ▪ Organotin compounds,	N/A	Verification: Declaration of non-use prior to shipping and storage supported by SDS.

	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 (Diisobutylphthalate) 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 not be used.		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 (Butylbenzylphthalat) ▪ 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 clothing where there is a risk that the accessory may be placed in the mouth e.g., zip handles:	N/A	Verification: SDS is to be provided for the plastic formulation.

	▪ 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 A.3.2: Biodegradability of auxiliaries and finishing agents for fibres and yarns

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 carbon 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.

A.4 Use of recycled materials and sourcing of renewable feedstocks for fibre production

The fibres contain either recycled content or are sourced from renewable feedstocks[509] in line with requirements A.4.1 to A.4.3 below, amounting in total to a minimum of 70 % by weight of all the fibres in the product. Documentation corresponding to the quantity of fibres used in the final product is provided from the spinning and/or fabric production stages. The 70% threshold can be met by complying with one or a combination of different requirements A.4.1 to A.4.3 below for the individual fibres forming part of the product. All documentation reference the Control Body or certifier of the different forms of fibres.

- **A.4.1** In the case of recycled content, it can originate from pre-consumer waste (including polymer and fibre production waste, cuttings from textile and clothing manufacturers) and post-consumer textile or non-textile waste, as long as the resulting fibre remains recyclable into new wearing apparel and the recycled content is traceable back to the reprocessing of the feedstock in line with the design for recycling criteria in section A.2 above. 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. The Textile Exchange Recycled Claim Standard, SCS Recycled content certification, UL Recycled Content Verification, or equivalent third-party verification schemes of the chain of custody are considered to be compliant with A.4.1.

- **A.4.2** In the case of virgin cotton and other natural cellulosic seed fibres, they are certified by an independent control body to have been produced in conformity with the production and inspection requirements according as laid down in Council Regulation (EC) No 834/2007, the US National Organic Programme (NOP) or equivalent legal

[509] Currently, materials in the fashion industry come from two sources. About 60% come from finite resources such as oil and other fossil fuels — these are used to make plastic-based (synthetic) fibres including polyester, nylon, acrylic, and elastane. The remainder come from renewable resources — these include cellulose-based fibres (for example cotton, hemp, flaxseed, viscose, and lyocell) and protein-based fibres (for example wool and silk). Due to conventional farming methods that use large amounts of synthetic fertilisers and pesticides, renewable and finite resource use are often intrinsically linked.

obligations on organic produce set by trade partners of the EU. The organic content may include organically grown cotton and transitional organic cotton[510].

- **A.4.3** In the case of virgin man-made cellulose fibres (including viscose, modal and lyocell), a valid, independently verified chain of custody certificate demonstrates that renewable feedstocks have been produced according to the principles of sustainable forest management as defined by the Food and Agriculture Organisation of the United Nations (UN FAO)[511]. Certifications by the Forest Stewardship Council (FSC), the Programme for the Endorsement of Forest Certification Schemes (PEFC International), or equivalent schemes are considered to be aligned with these principles and compliant with A.4.3.

A.5 Packaging

The primary and secondary packaging of the manufactured wearing apparel:

- Is either made of at least 80% recycled material. If the packaging is made from paper or cardboard, the remaining virgin material must be certified by the Forest Stewardship Council (FSC), the Programme for the Endorsement of Forest Certification Schemes (PEFC International), or equivalent schemes, and coatings with plastics or metals are not permitted. For plastic packaging only monomaterials without coatings are permitted, halogen-containing polymers are not permitted. A declaration of compliance is provided specifying the material composition of the packaging and the shares of recycled and virgin material.
- Or 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.

[510] In transition or transitional: transitioning production to organic certification usually takes place over a 36-month (three-year) period, unless using virgin land. It is an ongoing cycle of shifting conventional farming practices to an organic management system until the land qualifies to be certified organic under national or international organic standards. Also referred to as in-conversion cotton. For more information on the use of in-conversion cotton see here: https://textileexchange.org/wp-content/uploads/2021/02/In-Conversion-to-Organic-the-Basics-Final-020821-1.pdf

[511] http://www.fao.org/forestry/sfm/en/

- 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 conceive

B. Repair or refurbishment of wearing apparel

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 or refurbishment 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.

In case of repair and refurbishment, replaced parts are covered by a sales contract that complies with the requirements of Directive (EU) 2019/771. In particular, these requirements cover conformity of the product, liability of the seller (including the option of a shorter liability or limitation period), burden of proof, remedies for lack of conformity, repair or replacement of the goods, and commercial guarantees, among other requirements.

The product's materials and components that have not been reused in the same product are where possible reused elsewhere or recycled.

C. Sale of second-hand wearing apparel

The economic activity will extend the lifetime of wearing apparel already used by a customer (individual or organisation) through reselling to a new customer, potentially including prior

cleaning, repair, and/or refurbishment activities of damaged garments as needed**.** The activity complies with the following:

- The sold product is covered by a sales contract that complies with the requirements of Directive (EU) 2019/771. In particular, these requirements cover conformity of the product, liability of the seller (including the option of a shorter liability or limitation period), burden of proof, remedies for lack of conformity, repair or replacement of the goods, and commercial guarantees, among other requirements.

- If the product has been repaired, refurbished and/or remanufactured before reselling, the product's materials and components that have not been reused in the same product are where possible reused elsewhere, or recycled.

D. Design and implementation of a business model that extends lifespan in practice

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.

If the economic activity includes purchasing newly manufactured wearing apparel, it complies with the A.1 to A.4 criteria listed above.

If the economic activity is operated as an e-commerce, the primary and secondary packaging used:

o Is either made of at least 80 % recycled material. If the packaging is made from paper or cardboard, the remaining virgin material must be certified by the Forest Stewardship Council (FSC), the Programme for the Endorsement of Forest Certification Schemes (PEFC International), or equivalent schemes, and coatings with plastics or metals are not permitted. For plastic packaging only monomaterials without coatings are permitted, halogen-containing polymers are not permitted. A declaration of compliance is provided specifying the material composition of the packaging and the shares of recycled and virgin material.

o Or it has been designed to accomplish, or proves its ability to accomplish on average a minimum of 10 of 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

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 equivalent requirements are met. A certification of the laundry or dry-cleaning services by an ISO type 1 ecolabel is not required.

Do no significant harm ('DNSH')

(1) Climate change mitigation	• For economic activities covered by criteria set A: The direct GHG emissions associated with the generation of electricity and/or heat for the manufacturing of wearing apparel is at or lower than 270 gCO_2e/kWh. • For economic activities covered by criteria set B+C: N/A • For economic activities covered by criteria set D: Quantified reduction of lifecycle GHG emissions, including those related to the shipping of garments to the customer and back to the distribution centre as well as for laundry and dry cleaning of used wearing apparel, are documented annually as part of an Environmental Management System (EMS) that meets the requirements of Regulation EC 1221/2009 or ISO 14001. Lifecycle GHG emissions are calculated using the GHG accounting rules of the EU Product Environmental Footprint method referenced in Commission Recommendation (EU)

	2021/2279 or, alternatively, using ISO 14067:2018[512]. Quantified lifecycle GHG emissions are verified by an independent third party, using ISO 14065:2020[513], or equivalent.
(2) Climate change adaptation	DNSH as set out in Appendix 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	For economic activities covered by criteria B: N/A For economic activities covered by criteria set A and if the economic activities covered by criteria set D and C involve the laundry of used wearing apparel: • 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. • In all other cases, 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.

[512] https://www.iso.org/standard/71206.html

[513] https://www.iso.org/standard/74257.html

	• The water use is measured through a verifiable self-assessed mechanism, and water efficiency targets are aligned with the priority risks of the water source. The risks related to water scarcity and water stress in the concerned area are assessed using existing global datasets or risk-based tools.[514] • The water management plan and the water audits may be integrated and documented in the overall environmental management system of the economic operator or of a larger industrial site (e.g., cluster of textile plants). Sustainable levels of water abstraction are subject to a permit in accordance with the Directive 2000/60/EC if applicable.
(5) Pollution prevention and control	For economic activities covered by criteria set A: N/A because criterion A3 applies For economic activities covered by criteria set C and D: If the economic activity includes the manufacturing or purchasing of new wearing apparel, retreating and proofing of functional coatings, or the remanufacturing of used wearing apparel, the requirements of the latest EU Best Available Technology (BAT) Reference Document (BREF) for the Textile Industry addressing the pretreatment (operations such as washing, bleaching, mercerisation) or dyeing of fibres or textiles, are met.[515]
(6) Protection and restoration of biodiversity and ecosystems	As set out in Appendix D Generic criteria for DNSH to protection and restoration of biodiversity and ecosystems in Annex I of Commission Delegated Regulation (EU) 2021/2139 of 4 June 2021 supplementing Regulation (EU) 2020/852.

[514] https://www.wri.org/data/aqueduct-global-maps-21-data
https://waterriskfilter.org/explore/map

[515] https://eippcb.jrc.ec.europa.eu/reference/textiles-industry

	Additional DNSH criteria apply for economic activities covered by criteria set A and D related to the manufacturing or purchasing of new wearing apparel containing fibres that do not meet any of the criteria A.4.1 to A4.3: 1. In the case of cotton and other cellolusic seed fibres • They are grown according to 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 principles, and shall be grown without the use of any of the following substances: Aldicarb, aldrin, campheclor (toxaphene), captafol, chlordane, 2,4,5-T, chlordimeform, cypermethrin, DDT, dieldrin, dinoseb and its salts, endosulfan, endrin, heptachlor, hexachlorobenzene, hexachlorocyclohexane (total isomers), methamidophos, methylparathion, monocrotophos, neonicotinoids (clothianidine, imidacloprid, thiametoxam), parathion, pentachlorophenol. The total sum of the listed pesticides detected upon testing of the fibres shall not be greater than 0,5 ppm. • The economic activity provides evidence that the fibres have 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. Verification shall either be provided on an annual basis for each country of origin or on the basis of certifications for all IPM cotton purchased to manufacture the product. Compliance with the pesticide restriction shall not be required for schemes that prohibit use of the substances listed above, and where either testing is carried out or declarations of non-use are obtained from farmers and/or farmer producer groups that are verified by site visits carried out by control bodies accredited by either national governments or recognised organic or IPM certification schemes. 2. In the case of virgin man-made cellulose fibres (including viscose, modal and lyocell), sourcing of feedstocks meets the requirements in

	Regulation (EU) 995/2010 to prevent products derived from illegally harvested timber to be placed on the market.

Rationale

Description of the activity

- Given the historic decline in the price of 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. It is estimated that more than half of fast fashion produced is disposed of in under a year.[516]
- As closed-loop recycling of used wearing apparel with fibres being recycled into similar value of use is almost non-existent today, a substantial contribution to expand circular practices in the sector must focus on value retention over material recovery, ultimately reducing resource consumption and pollution associated with the manufacturing and selling of new wearing apparel.

Technical screening criteria SC

Transition to a circular economy – Criteria set A

- 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 A is making a substantial contribution to the circular design and production of new garments by building on the environmental ambition level of

[516] Ellen MacArthur Foundation, A New Textiles Economy: Redesigning fashion's future, 2017

existing ISO Type 1 Ecolabels and the EU voluntary criteria for Green Public Procurement where relevant, e.g., regarding durability (A1) and restrictions of hazardous chemicals (A3), building on available industry standards and schemes such as the oekotex100 standard and the AFIRM RSL.

- The A2 design for recycling criteria are based on the recycling matrix in the Accelerating Circularity report on modelling and linking (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 and similar projects (https://www.ellenmacarthurfoundation.org/our-work/activities/make-fashion-circular/the-jeans-redesign).

- Almost a third of all textile waste today includes items that makes them unsuitable for fibre- to-fibre recycling, such as multi-layer clothing and textiles with a blend of three or more different fibre types. Clothes that contain mixed fibres, a high content of elastane and hard elements such as buttons, zippers are difficult to recycle even in high-quality processes (Joint Research Center of the European Commission, Circular Economy Perspectives in the EU Textile sector, 2021). Currently, little textile-to-textile recycling takes place due to technical challenges in fibre separation and fibre quality (EEA, Textiles in Europe's Circular Economy, 2021).

- Given the fact that most wearing apparel is made from virgin fibres, the current criteria proposal is limited to fibre blends and product constructions that can be remanufactured or recycled into new wearing apparel in practice today. Currently, materials in the fashion industry come from two sources. About 60% come from finite resources such as oil and other fossil fuels — these are used to make plastic-based fibres including polyester, nylon, acrylic, and elastane. The remainder come from renewable resources — these include cellulose-based fibres (for example cotton, hemp, flaxseed, viscose, and lyocell) and protein-based fibres (for example wool and silk). Due to conventional farming methods that use large amounts of

synthetic fertilisers and pesticides, renewable and finite resource use are often intrinsically linked.[517]

- Therefore, the A4 criteria on the use of recycled materials and meeting different requirements for the sourcing of renewable feedstocks for fibre production sets out a combined but ambitious threshold of 70% by weight. While for polyester fibres this can only be met by using recycled content, other fibre types can rely on a combination of recycled and virgin feedstocks. By doing so, a variety of different garments can qualify for a substantial contribution to a circular economy.

- The examples that we have looked at are based on the Textile Exchange's Preferred Fiber and Materials Market Reports or come from the business network of the Ellen MacArthur Foundation (https://www.ellenmacarthurfoundation.org/our-work/activities/make-fashion-circular/participants): E.g., for cashmere, some brands are already claiming more than 90% recycled content. Wool is usually blended with virgin fibres with some companies achieving more than 50% recycled content, and the Cardato certification programme demanding 65% for example. 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, the GRS standard requires a minimum of 20%, considering that best practices get to 50% as a maximum with the remainder being virgin cotton or polyester. For example, H&M made a collection from a mix of organic cotton and up to 35% post-consumer recycled cotton. In addition, their designers switched from polyester to TENCEL™ lyocell threads, thus increasing the recyclability potential of the garment.

- The European Environmental Agency (EEA 2019) published a briefing on "Textiles and the environment": The maximum share of recycled cotton fibres in new cotton clothing is currently about 30 per cent, while recycled denim in jeans products amounts to 50 per cent (Wolkat, 2019; HNST, 2019). Up to 50 per cent recycled cotton is also used in some blended yarns, in which cotton is mixed with synthetic fibres such as recycled PET or nylon (Recover, 2019). Some applications of

[517] For more details see https://textileexchange.org/preferred-fiber-and-materials-market-report/

recycled polyester fibres, such as duvet filling, contain about 50 per cent recycled content (Watson et al., 2017).

- In the coming years the textile industry will face significant changes in the regulatory environment, technological developments, business models and supply networks. Once the European Commission has approved the EU Product Environmental Footprint Category Rules (PEFCR) for Apparel and Footwear[4], there will be new tools available to assess the contribution of economic activities in the sector towards environmental objectives under the EU taxonomy regulation. In response to the upcoming EU Strategy for Sustainable Textiles and legislative proposals under the new EU Sustainable Products Initiative, we expect new regulatory measures, industry benchmarks and design standards to be developed. These developments should be reflected in form of a review and update of the current criteria proposal on substantial contribution to a circular economy e.g., in 2025.

Transition to a circular economy – Criteria B and C

- Criteria B and C are 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 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 of wearing apparel are widely available for

consumers. (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

- Please note that these economic activities might be integrated into a new cross-sectoral criteria set on 'Repair, refurbishment and remanufacturing, and sale of spare parts' as well as into a separate proposal for ‘Sale of secondhand goods’ and ‘Resale Platforms’. These criteria sets would include but are not limited to products covered by the scope of NACE Codes C14.1 and C14.3.

Transition to a circular economy – Criteria set D

- Criteria set D 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

- Please note that these economic activities might be integrated into a new cross-sectoral criteria set on ‘Circular use- and resulted-oriented service models’ which would include but is not limited to products covered by the scope of NACE Codes C14.1 and C14.3

Technical screening criteria DNSH

- Our current proposal for DNSH criteria builds on generic formulations used in the DNSH criteria in the EC climate delegated act under the EU Taxonomy Regulation

(EU) 2020/852. However, we have now clearly distinguished if the DNSH requirements are applicable to the different types of economic activities covered by the A, B, C or D criteria or to all of them.

- We aligned the DNSH criteria on sustainable use and protection of water and marine resources with the criteria defined for C13.30 on Textile Finishing.
- The DNSH criteria on pollution prevention and control need to be updated as soon as suitable industry standards become available to reduce microfiber pollution.

For further consideration in future work of the EU Sustainable Finance Platform

- An additional criteria proposal on substantial contribution to prevent and control of microfiber pollution related to economic activities in the context of C13 and C14 manufacture of textiles and wearing apparel could be developed at a later stage of the taxonomy work. This proposal could include parameters for textile design (fibre length, yarn spinning, weaving, fabric construction), finishing treatments and dyeing processes, industrial pre-washing of items including effective filtration systems, and potential requirements on biodegradability of fibres.

2.8 Footwear and leather goods: manufacturing, repairing/refurbishing/remanufacturing, sale of second-hand, product-as-a-service and other circular use- and result-oriented service models

Description of the activity

Different types of economic activities related to footwear and leather goods are within scope:

1. Manufacturing of footwear and leather goods:

    - **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, refurbishment and remanufacturing** 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.

    - **Repair, refurbishment and remanufacturing** of goods produced by the following activities classified under NACE codes:

        - C14.11 Manufacture of leather wearing apparel.

        - C14.19 Manufacture of leather gloves and hats.

- C15.12 Manufacture of luggage, handbags and the like, saddlery and harness.
- C15.20 Manufacture of footwear

where, for the purpose of this file, in line with definitions by the International Resource Panel by the United Nations Environment Programme[1]:

- 'repair' means the process of returning a faulty product to a condition where it can fulfil its intended use;
- 'refurbishment' means modification of a product to increase or restore its performance and/or functionality or to meet applicable technical standards or regulatory requirements, with the result of making a fully functional product to be used for a purpose that is at least the one that was originally intended;
- 'remanufacturing' means a standardized industrial process that takes place within industrial or factory settings, in which products are restored to original as-new condition and performance or better, typically placed on the market with a commercial guarantee.

3. **Sale of footwear and leather goods.** Included activities are classified under NACE codes:
   - G46 Wholesale trade, except of motor vehicles and motorcycles
   - G47 Retail trade, except of motor vehicles and motorcycles

   in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006, limited to trade in goods produced by the activity classified under NACE codes C14.11, C14.19, C15.12 and C15.20.
4. **The scope also includes economic activities that provides customers (household or organisation) with access to products through service models**, with limitation to products that are manufactured by the following activities classified under NACE codes C14.11, C14.19, C15.12 and C15.20.
   These service models can be:
   - Either use-oriented services, where the product is still central, but its ownership remains with the provider and the product is leased, shared, rented or pooled.
   - Or result-oriented, where payment is by pre-defined and agreed result, i.e., pay per service unit delivered.

Substantial contribution to transition to a circular economy

To contribute substantially to the circular economy, the economic activity in scope complies with at least one of criteria sets (A, B, C or D) below. There can be overlaps between the economic activities covered by the different criteria sets, as these are not mutually exclusive.

A. Design and manufacturing of new leather goods and footwear

The economic activity complies with all of the following criteria:

- **Guarantee:** The sold product is covered by a sales contract that complies with the requirements of Directive (EU) 2019/771. In particular, these requirements cover conformity of the product, liability of the seller (including the option of a shorter liability or limitation period), burden of proof, remedies for lack of conformity, repair or replacement of the goods, and commercial guarantees, among other requirements.

- **Spare parts:** spare parts are available to customers for a period of at least 4 years from the date of purchase of the new product. The spare part offered does not have to be identical to the original part but is able to replace the original part and fulfil its function. Information about spare parts is communicated to the customer, and spare parts are available to independent repair services.

- **Design to facilitate reuse and recycling:** Design and production methods are used that allow for:
    - Disassembly and reassembly of main parts of footwear and leather goods (e.g., change of footbed, disassembling and assembling of soles). A description of the options and necessary steps to facilitate reuse and repair is provided on the manufacturer's website.
    - Separation the different materials of used for footwear and leather goods to facilitate recycling. Inseparable parts of footwear and leather goods are based on the same material to allow for a common recycling process. A description of how to separate the different materials after use, including their recycling options, is provided on the manufacturer's website.

In addition, the economic activity complies with one of the following:

A.1 The economic activity leads to a footwear product that is compliant with the EU Ecolabel for footwear (2016/1349/EU), the Blue Angel Ecolabel for footwear (DE-UZ 155) or another internationally recognised ISO type 1 ecolabel that contains equivalent requirements.

A.2. The economic activity complies with all of the following criteria:

- **Durability:** In the case of footwear, the product complies with minimum performance requirements, wear resistance of surfaces and functional properties according to the Supplementary Material 1 section for footwear. Compliance with this requirement is demonstrated by submitting test reports.

- **Restriction of hazardous chemicals:** All components of footwear and leather goods that account for more than 3% by mass of the final product, and all materials that could possibly come into contact with the skin do not contain any of the following substances:
    - 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.
    - Substances which according to the criteria of Regulation (EC) No 1272/200820 are assigned the following H Phrases named in the Supplementary Material 2 section or which meet the criteria for such classification do not exceed a concentration of 0.10% by mass.
    - Impurities in concentrations that are not specified in the safety data sheet are exempted from the requirements above.
    - The components listed in 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 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.
    - Monomers or additives are exempted if they turn into polymers during the manufacture of plastics or are chemically (covalently) bound to the plastic

and 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 comply with the limit values in Chapter 1 of the ZDHC MRSL.
- Leather: Leather dyes and tanning auxiliaries comply with the limit values Chapter 2 of the ZDHC MRSL.
- The use of biocides in components of footwear and leather goods, and in the final product in order to impart biocidal properties is not permitted. Biocidal active substances used for in-can preservation approved for product type 6 and biocidal active substances to protect raw hides and tanned semi-finished products (wet blue, wet white) during storage and transportation approved for product group 9 according to the EU Biocidal Products Regulation (EU/528/2012)[518] are exempted.
- The use of perfluorinated and polyfluorinated chemicals (PFCs), and the use of flame retardants is not permitted.

The manufacturer submits confirmation from their suppliers verifying compliance with the requirements above and submit the relevant safety data sheets. For the exempted substances and mixtures listed in the Supplementary Material 3 section, the manufacturer submits verifications that all exemption conditions have been met.

In addition, footwear and leather goods meet the requirements of one of the following Restricted Substance Lists (RSL):

- EU Ecolabel for footwear (2016/1349/EU)[519]
- Blue Angel Ecolabel for footwear (DE-UZ 155)[520]
- Apparel & Footwear International RSL Working Group (AFIRM) Version 6 (2021)[521]

[518] https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32012R0528&from=EN

519 https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32016D1349&from=EN

520 https://produktinfo.blauer-engel.de/uploads/criteriafile/en/DE-UZ%20155-201807-en%20criteria-V3.pdf

[521] https://afirm-group.com/afirm-rsl/

- or an equivalent RSL covering at least the following groups of substances with comparable content limits for:
    - Chlorinated benzenes and toluenes
    - Chlorophenols
    - Dimethylformamide, dimethylacetamide amd N-methylpyrrolidone
    - Dyes
    - Extractable heavy metals
    - Formaldehyde
    - Nickel and its compounds
    - Organotin compounds
    - Phthalates and plasticisers
    - Polycyclic aromatic hydrocarbons

- **Packaging:** The primary and secondary packaging of the manufactured footwear or leather goods is:
    - Either made of at least 80% recycled material. If the packaging is made from paper or cardboard, the remaining virgin material must be certified by the Forest Stewardship Council (FSC), the Programme for the Endorsement of Forest Certification Schemes (PEFC International), or equivalent schemes, and coatings with plastics or metals are not permitted. For plastic packaging only monomaterials without coatings are permitted, halogen-containing polymers are not permitted. A declaration of compliance is provided specifying the material composition of the packaging and the shares of recycled and virgin material.

    - Or 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 conceive

- **Water Consumption**: For tanning of leather used for footwear and leather goods process integrated techniques to reduce water consumption are implemented, such as use of short floats, reuse and recycling of treated process and wastewater. Water consumption for tanning of leather for footwear and leather goods from raw hides and skins to finished leather is limited to 25 m3/t for cattle, 45 m3/t for calf and goat skins, 80 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.

- **Sourcing:**
  - **If the activity uses raw hides and skins, the hides and skins come** only from animals raised for milk or meat production, and the activity does not use hides and skins from animals raised for the sole purpose of producing hides and skins. In the EU, documentation is required provided 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 7.10 (P7.1) from the Leather Working Group is provided.

- **If the activity uses textiles fibres,** the fibres contain either recycled content or are sourced from renewable feedstocks[522] in line with requirements below, amounting in total to a minimum of 70% by weight of all the fibres in the product. Documentation corresponding to the quantity of fibres used in the final product is provided from the spinning and/or fabric production stages. The 70% threshold can be met by complying with one or a combination of different requirements below for the individual fibres forming part of the product. All documentation reference the Control Body or certifier of the different forms of fibres.

    - In the case of recycled content, it can originate from pre-consumer waste (including polymer and fibre production waste, cuttings from textile and clothing manufacturers) and post-consumer textile or non-textile waste, as long as the resulting fibre remains recyclable into new wearing apparel and the recycled content is traceable back to the reprocessing of the feedstock. 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. The Textile Exchange Recycled Claim Standard, SCS Recycled content certification, UL Recycled Content Verification, or equivalent third-party verification schemes of the chain of custody are considered to be compliant.

    - In the case of virgin cotton and other natural cellulosic seed fibres, they are certified by an independent control body to have been produced in conformity with the production and inspection requirements according as laid down in Council Regulation (EC) No

[522] Currently, materials in the fashion industry come from two sources. About 60% come from finite resources such as oil and other fossil fuels — these are used to make plastic-based (synthetic) fibres including polyester, nylon, acrylic, and elastane. The remainder come from renewable resources — these include cellulose-based fibres (for example cotton, hemp, flaxseed, viscose, and lyocell) and protein-based fibres (for example wool and silk). Due to conventional farming methods that use large amounts of synthetic fertilisers and pesticides, renewable and finite resource use are often intrinsically linked.

834/2007, the US National Organic Programme (NOP) or equivalent legal obligations on organic produce set by trade partners of the EU. The organic content may include organically grown cotton and transitional organic cotton[523].

- In the case of virgin man-made cellulose fibres (including viscose, modal and lyocell), a valid, independently verified chain of custody certificate demonstrates that renewable feedstocks have been produced according to the principles of sustainable forest management as defined by the Food and Agriculture Organisation of the United Nations (UN FAO)[524]. Certifications by the Forest Stewardship Council (FSC), the Programme for the Endorsement of Forest Certification Schemes (PEFC International), or equivalent schemes are considered to be aligned with these principles and compliant.

B. Repair, refurbishment or remanufacturing

The economic activity consists of repairing, refurbishing or remanufacturing footwear or leather goods that have been used for their intended purpose before by a customer (household or organisation), complying with the following:

- In case of repair and refurbishment, replaced parts are covered by a sales contract that complies with the requirements of Directive (EU) 2019/771. In particular, this covers rules on the conformity of replaced parts with the contract, remedies in the event of a lack of such conformity, the modalities for the exercise of those remedies, and on commercial guarantees, including the potentially shortened liability or limitation period for second-hand parts.

[523] In transition or transitional: transitioning production to organic certification usually takes place over a 36-month (three-year) period, unless using virgin land. It is an ongoing cycle of shifting conventional farming practices to an organic management system until the land qualifies to be certified organic under national or international organic standards. Also referred to as in-conversion cotton. For more information on the use of in-conversion cotton see here: https://textileexchange.org/wp-content/uploads/2021/02/In-Conversion-to-Organic-the-Basics-Final-020821-1.pdf

[524] http://www.fao.org/forestry/sfm/en/

- In case of remanufacturing, the remanufactured product is covered by a sales contract that complies with the requirements of Directive (EU) 2019/771. In particular, this covers rules on the conformity of replaced parts with the contract, remedies in the event of a lack of such conformity, the modalities for the exercise of those remedies, and on commercial guarantees, including the potentially shortened liability or limitation period for second-hand products.
- The product's materials and components that have not been reused in the same product are where possible reused elsewhere or recycled.

C. Sale of second-hand goods

The economic activity consists of selling second-hand goods that have been used for their intended purpose before by a customer (household or organisation), possibly after repair, refurbishment and/or remanufacturing, and complies with the following:

- The sold product is covered by a sales contract that complies with the requirements of Directive (EU) 2019/771. In particular, this covers rules on the conformity of replaced parts with the contract, remedies in the event of a lack of such conformity, the modalities for the exercise of those remedies, and on commercial guarantees, including the potentially shortened liability or limitation period for second-hand products.

- If the product has been repaired, refurbished and/or remanufactured before reselling, the product's materials and components that have not been reused in the same product are where possible reused elsewhere or recycled.

D. Design and implemention a business model that extends lifespan in practice

The economic activity complies with all of the following criteria:

- **The activity provides the customer (household or organisation) with access to and use of footwear or leather goods, while ensuring the ownership remains with the company providing this service, such as a manufacturer, specialist or**

retailer. The contractual terms and conditions ensure that all the following points are met:

- There is an obligation for the provider of the service to take back the used product at the end of the contractual agreement;
- There is an obligation for the customer to give back the used product at the end of the contractual agreement;
- The provider of this service remains owner of the product;
- The customer pays for access to and use of the product, or the result of access to and use of this product.

- **The activity leads to extended lifespan and/or increased use intensity of the product in practice.** The footwear or leather goods offered through this activity complies with one of the following:
  - A lifespan of at least twice the EU average for that product category, accounting for differences between B2B and B2C contexts, under the condition of an average use intensity;
  - A use intensity of at least twice the EU average for that product category, accounting for differences between B2B and B2C contexts, under the condition of an average lifespan;
  - A combination of extended lifespan and increased use intensity, such that 'lifespan times use intensity' is at least twice the EU average, accounting for differences between B2B and B2C contexts.

- **Packaging:** If the economic activity is operated as an e-commerce, the primary and secondary packaging of the manufactured footwear or leather goods is:
  - Is either made of at least 80 % recycled material. If the packaging is made from paper or cardboard, the remaining virgin material must be certified by the Forest Stewardship Council (FSC), the Programme for the Endorsement of Forest Certification Schemes (PEFC International), or equivalent schemes, and coatings with plastics or metals are not permitted. For plastic packaging only monomaterials without coatings are permitted, halogen-containing polymers are not permitted. A declaration of compliance is provided specifying the material composition of the packaging and the shares of recycled and virgin material.
  - Or it has been designed to accomplish, or proves its ability to accomplish on average a minimum of 10 of 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

Do no significant harm ('DNSH')

(1) Climate change mitigation	• For economic activities covered by criteria set A: The direct GHG emissions associated with the generation of electricity and/or heat for the manufacturing of wearing apparel is at or lower than 270 gCO_2e/kWh. • For economic activities covered by criteria set B+C: N/A • For economic activities covered by criteria set D: Quantified reduction of lifecycle GHG emissions, including those related to the shipping of footwear or leather goods to the customer and back to the distribution centre are documented annually as part of an Environmental Management System (EMS) that meets the requirements of Regulation EC 1221/2009 or ISO 14001. Lifecycle GHG emissions are calculated using the GHG accounting rules of the EU Product Environmental Footprint method referenced in Commission Recommendation C(2021) 9332[525] or, alternatively, using ISO 14067:2018[526]. Quantified

[525] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=PI_COM%3AC%282021%299332

[526] https://www.iso.org/standard/71206.html

	lifecycle GHG emissions are verified by an independent third party, using ISO 14065:2020[527], or equivalent.
(2) Climate change adaptation	DNSH as set out in Appendix 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	In case of the (re-)manufacturing of leather goods and footwear, the economic activity complies with all the following criteria: • 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. • In all other cases, 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 use is measured through a verifiable self-assessed mechanism, and water efficiency targets are aligned with the priority risks of the water source. The risks related to water scarcity and water

[527] https://www.iso.org/standard/74257.html

	stress in the concerned area are assessed using existing global datasets or risk-based tools.[528] The water management plan and the water audits may be integrated and documented in the overall environmental management system of the economic operator or of a larger industrial site (e.g., cluster of textile plants). Sustainable levels of water abstraction are subject to a permit in accordance with the Directive 2000/60/EC if applicable.
(5) Pollution prevention and control	In case of the (re-) manufacturing of leather goods and footwear, the economic activity complies with all of the following criteria: • Total emissions of volatile organic compounds (VOC) during the final production process for the shoes and during coating of leather used for leather goods do not exceed the limit values set in annex VII part 2, Nr. 13 and 14 of the Industrial Emission Directive (2010/75/EU). • For tanning of leather used for footwear and leather goods, wastewater parameters are within the minimum threshold limits for direct water discharge as set out in latest version of the BAT conclusions on tanning of hides and skins (Commission implementing decision 2013/84/EU). • For finishing of textiles used for footwear and leather goods, wastewater parameters are within the minimum threshold limits for direct water discharge as set out in latest version of the BAT conclusions Textile Industry (currently under revision)
(6) Protection and restoration of	As set out in Appendix D Generic criteria for DNSH to protection and restoration of biodiversity and ecosystems in Annex I of Commission

[528] https://www.wri.org/data/aqueduct-global-maps-21-data
https://waterriskfilter.org/explore/map

biodiversity and ecosystems	Delegated Regulation (EU) 2021/2139 of 4 June 2021 supplementing Regulation (EU) 2020/852. In case of the (re-)manufacturing of leather goods and footwear, the economic activity complies additionally with all of the following criteria: • Hides and skins do not originate from biodiversity-sensitive areas. For hides and skins originating from locations near biodiversity-sensitive areas (such as the Amazonian biome in Brazil and the Chaco biome in Paraguay) an appropriate assessment based on the traceability (incoming) requirements of the Leather Manufacturer Audit Protocol 7.1 (P7.1) from the Leather Working Group has been conducted by the tannery, that the supplying slaughterhouse's own immediate suppliers are not involved in deforestation, invasion of indigenous lands and/or protected areas. • 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.**

	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: **H-Phrases according to Regulation (EC) No. 1272/2008**

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 3 section: **Derogated hazard classifications by substance group, including derogation conditions.**

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	High fixation level of dyes in the leather (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
Pigments	H351 - Suspected of causing cancer	Titanium dioxide may be used as a white pigment in all applications in scope.

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 G46 and G47. 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 second-hand leather goods and footwear has been included too.

TECHNICAL SCREENING CRITERIA RATIONALE

Criteria set A on the design and manufacturing new footwear and leather goods to:

- Enable lifespan extension, reuse and recycling by creating transparency on material content, in line with EU Taxonomy Regulations Art 13.1. (a), (h) and (I)
- Enable extension of product lifespan through better design, in line with EU Taxonomy Regulation 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, in line with EU Taxonomy Regulation TR 13.1 (d)

Criteria sets B and C focus on extending the lifespan of existing footwear and leather goods through repair, refurbishment and remanufacturing as well through the sale of second-hand goods to:

- Enable collection of used footwear and leather goods, in line with EU Taxonomy Regulation Art 13 (e) & (g)
- Extend product lifespan directly, by collecting, reselling and repairing footwear and leather items, in line with Eu Taxonomy Regulation Art 13 (e) & (g)

- Reduce the use of primary materials, with a substantial part of goods' components being retained, in line with Taxonomy Regulation Art 13 (a)

Criteria set D. on extending lifespan of new and existing footwear and leather goods through circular business models to

- Enable collection of used leather items, in line with EU Taxonomy Regulation Art 13 (e) & (g)
- Enable extension of product lifespan through better design, in line with Taxonomy Regulation Art 13 (b)
- Extend product lifespan directly, in line with EU Taxaonomy Regulation Art 13 (e) & (g) this requires additional requirements to avoid unintended consequences

Concluding remarks

In the coming years the leather and textile industry will face significant changes in the regulatory environment, technological developments, business models and supply networks. Once the European Commission has approved the EU Product Environmental Footprint Category Rules (PEFCR) for Apparel and Footwear[4], there will be new tools available to assess the contribution of economic activities in the sector towards environmental objectives under the EU taxonomy regulation. In response to the upcoming EU Strategy for Sustainable Textiles and legislative proposals under the new EU Sustainable Products Initiative, we expect new regulatory measures, industry benchmarks and design standards to be developed. These developments should be reflected in form of a review and update of the current criteria proposal on substantial contribution to a circular economy e.g., in 2025.

This TSC proposal has been developed in parallel to the one on a substantial contribution to the transition to a circular economy for wearing apparel. This high level of structural alignment between the two categories of economic activities should be maintained in future revisions of the taxonomy criteria.

2.9 Tanning of leather

Description of the activity

The Tanning process[529] is converting highly putrescible raw hides or skins into durable leather, which can be used to make a wide range of products. The economic activities in this category do not include manufacture of composition leather and scraping, shearing, plucking, currying, tanning, bleaching and dyeing of fur skins and hides with the hair on. The economic activities in this category could be associated with NACE code C 15.11 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

Substantial contribution to Pollution prevention and control

The economic activity complies with all of the following criteria:

- **Sourcing practices reducing pollution.** The economic activity complies with the following criteria:
    - The activity uses raw hides and skins only from animals raised for milk or meat production, and does not use hides and skins from animals raised for the sole purpose of producing hides and skins .
    - In the EU, documentation is provided 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 7.1 (P7.1) from the Leather Working Group[530] is provided.

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[529] The entire process involves a series of complex chemical reactions and mechanical processing steps, including unhairing, tanning, dyeing and finishing.

[530] https://www.leatherworkinggroup.com/how-we-work/audit-protocols/leather-manufacturer-audit-protocol-7-0

- **Safe and efficient management of water, chemicals and waste.** The economic activity complies with one of the following criteria:
    - 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), other environmental management systems recognized in accordance with Regulation EC 1221/2009 article 45 (such as Eco-Lighthouse), 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;

        - Description of relevant measures applied to minimise the generation of waste, to optimise the reuse, regeneration, recycling and/or recovery of waste and to ensure the proper collection, storage and safe disposal of hazardous and non-hazardous wastes;

        - 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 on a regular basis.

- **Restrictions for the use of substances of very high concern (SHVC) and other critical chemicals.** The economic activity complies with the following criteria:

  - Tanning processes for footwear products certified by the German Blue Angel Ecolabel (DE-UZ 155) are considered to be compliant. Tanning processes for footwear products certified by the EU Ecolabel (2016/1349/EU) are considered to be compliant if a declaration of compliance with the ZDHC MRSL Version 2.0 is provided.

  - 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.

    - 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").

    - Tanning agents and auxiliaries comply with the limit values in Chapter 2 of the ZDHC Manufacturing Restricted Substance List (MRSL), Version 2.0.[531]
    - No tanning agents and auxiliaries are added, which according to the criteria of Regulation (EC) No 1272/200818 are assigned the H Phrases

[531] https://mrsl.roadmaptozero.com/

listed in the Supplementary Material-1 section or which meet the criteria for such classification.

- The use of perfluorinated and polyfluorinated chemicals (PFCs) is not permitted.

- 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 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.

- **Water Use**: The economic activity complies with one of the following criteria:

  - Tanning processes for footwear products certified either by the German Blue Angel Ecolabel (DE-UZ 155) or by the EU Ecolabel (2016/1349/EU) are considered to be compliant.

  - 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, 80 m³/t for pigskins, 180 l/skin for sheepskins. A declaration of compliance is provided together with documents specifying the annual production volumes and the water consumption. This information must refer to the entire tanning process. If intermediate products are processed (e.g., wet blue), the water consumption figures for the production of the intermediate product must be requested from the suppliers.

- **Wastewater quality and treatment.** The economic activity complies with one of the following criteria:

    - 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 all of 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.
    - The averaging period requires a 24-hour composite sample. In the case of batch discharge: average values over the release duration taken as flow-proportional composite samples, or provided that the effluent is appropriately mixed and homogeneous, a spot sample taken before discharge.
    - 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.

- **Air emissions.** The economic activity complies with at least one of the following:

    - The activity reduces airborne emissions of volatile organic compounds (VOC) from leather finishing by using of water-borne coatings in combination with an efficient application system. The level of solvent use is below:

        - 25 g/m² for finished upholstery and automotive leather expressed as annual average

- 85 g/m² for finished leather for footwear, garment and leather goods and coated leathers expressed as annual average

A declaration of compliance is provided together with documents specifying the annual consumption of solvents and the amount of leather finished in m². For the recording of solvent consumption, not only the solvents bought as solvents, but also the solvents contained in the finishing chemicals are included.

o The activity reduces airborne emissions of volatile organic compounds (VOC) from leather finishing by using of extraction ventilation and an abatement system. The level for VOC emissions is below 20g total carbon /m² for finished leather expressed as annual average.

Reports on regular monitoring of the VOC emissions to ensure compliance are provided.

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 Appendix 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	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.

	In all other cases, the economic activity complies with all of the following criteria: • 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 targets, 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 use is measured through a verifiable self-assessed mechanism, and water efficiency targets are aligned with the priority risks of the water source. The risks related to water scarcity and water stress in the concerned area are assessed using existing internationally recognised global datasets or risk-based tools[532]. • 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. The water management plan and the water audits may be integrated and documented in the overall water management plan or environmental management system (EMS) of a larger industrial site (e.g., cluster of textile plants). Sustainable levels of water abstraction are subject to a permit in accordance with the Directive 2000/60/EC or national legislation.

[532] https://www.wri.org/data/aqueduct-global-maps-21-data
https://waterriskfilter.org/explore/map

(4) Transition to a circular economy	The activity assesses availability of and adopts techniques that support: (a) reuse of products and components, and use of secondary raw materials, including re-used or recycled water and chemicals in the leather tanning process (b) design for longevity, sharing, repair, reuse, repurposing, disassembly, remanufacturing, and recycling of leather products (c) waste management that prioritises prevention and preparing for reuse and for recycling over incineration and disposal of waste in the leather tanning process (d) information on and traceability of chemical content and material composition throughout the lifecycle of the finished leather products
(6) Protection and restoration of biodiversity and ecosystems	As set out in Appendix D Generic criteria for DNSH to protection and restoration of biodiversity and ecosystems in Annex I of Commission Delegated Regulation (EU) 2021/2139 of 4 June 2021 supplementing Regulation (EU) 2020/852 In addition, hides and skins do not originate from biodiversity-sensitive areas. For hides and skins originating from locations near biodiversity-sensitive areas (such as the Amazonian biome (Brazil) and the Chaco biome (Paraguay) an appropriate assessment based on the traceability (incoming) requirements of the Leather Manufacturer Audit Protocol 7.1 (P7.1) from the Leather Working Group has been conducted by the tannery, that the supplying slaughterhouse's own immediate suppliers are not involved in deforestation, invasion of indigenous lands and/or protected areas in the Amazonian biome (Brazil) or in the Chaco biome (Paraguay). 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)

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

Substances and mixtures	Scope of validity for the exemption	Exemption conditions
Dyes for tanning leather	H317, H411	High fixation level of dyes in leather (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 substance 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
Pigments	H351 - Suspected of causing cancer	Titanium dioxide may be used as a white pigment in all applications in scope.

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 (Qualified random sample or 2-hour composite sample) (1)
COD	mg/l	200
BOD_5	mg/l	20
NH^4-N	mg/l	10
P_{total}	mg/l	1
TSS	mg/l	35
Cr_{total}	mg/l	0,3
Cr VI	mg/l	0,05
S^{2-}	mg/l	0,5

(1) the case of batch discharge, average values over the release duration taken as flow-proportional composite samples, or, provided that the effluent is appropriately mixed and homogeneous, a spot sample taken before discharge.

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 (Qualified random sample or 2-hour composite sample)(1)
Cr_{total}	mg/l	0,3
Cr VI	mg/l	0,05
S^{2-}	mg/l	0,5

(1) the case of batch discharge, average values over the release duration taken as flow-proportional composite samples, or, provided that the effluent is appropriately mixed and homogeneous, a spot sample taken before discharge.

Rationale

Description of the activity

Technical Screening Criteria SC

Sourcing practices reducing water consumption

- Animal raising leads to contamination of ground and surface water e.g., by 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[533].

- 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)

[533] https://www.blauer-engel.de/en/products/business-municipality/leather

Technical Screening Criteria DNSH

Except for the protection and sustainable use of freshwater and marine sources as well as for the protection and restoration of biodiversity and ecosystems, the proposal for DNSH criteria builds mostly on generic formulations used in the EC delegated act on climate change mitigation and adaptation under the EU Taxonomy Regulation (EU) 2020/852.

In addition, specific DNSH criteria for the 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.

2.10 Repair, refurbishment and remanufacturing, and sale of spare parts

Description of the activity

Included activities are:

A. Repair, refurbishment and remanufacturing of goods produced by the following activities classified under NACE codes:

- C13 Manufacture of textiles
- C14 Manufacture of wearing apparel
- C15 Manufacture of leather and related products
- C16 Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
- C22 Manufacture of rubber and plastic products
- C23.3 Manufacture of clay building materials
- C23.4 Manufacture of other porcelain and ceramic products
- C25.1 Manufacture of structural metal products
- C25.2 Manufacture of tanks, reservoirs and containers of metal
- C25.7 Manufacture of cutlery, tools and general hardware
- C25.9 Manufacture of other fabricated metal products
- C26 Manufacture of computer, electronic and optical products
- C27 Manufacture of electrical equipment
- C28.22 Manufacture of lifting and handling equipment
- C28.23 Manufacture of office machinery and equipment (except computers and peripheral equipment)
- C28.24 Manufacture of power-driven hand tools
- C28.25 Manufacture of non-domestic cooling and ventilation equipment
- C28.93 Manufacture of machinery for food, beverage and tobacco processing, excluding machinery for tobacco processing
- C28.94 Manufacture of machinery for textile, apparel and leather production
- C28.95 Manufacture of machinery for paper and paperboard production
- C28.96 Manufacture of plastic and rubber machinery
- C31 Manufacture of furniture
- C32 Other manufacturing;

where, for the purpose of this file, in line with definitions by the International Resource Panel by the United Nations Environment Programme[534]:

- 'repair' means the process of returning a faulty product to a condition where it can fulfil its intended use;
- 'refurbishment' means modification of a product to increase or restore its performance and/or functionality or to meet applicable technical standards or regulatory requirements, with the result of making a fully functional product to be used for a purpose that is at least the one that was originally intended;
- 'remanufacturing' means a standardized industrial process that takes place within industrial or factory settings, in which products are restored to original as-new condition and performance or better, typically placed on the market with a commercial guarantee.

Replacement of consumables (e.g., printer ink) and maintenance are both excluded from these activities.

B. Sale of spare parts beyond legal obligations, for use in goods produced by the following activities classified under NACE codes:

- C26 Manufacture of computer, electronic and optical products
- C27 Manufacture of electrical equipment
- C28.22 Manufacture of lifting and handling equipment
- C28.23 Manufacture of office machinery and equipment (except computers and peripheral equipment)
- C28.24 Manufacture of power-driven hand tools
- C31 Manufacture of furniture

where, for the purpose of this file and in line with Directive 2011/65/EU, 'spare part' means a separate part of a product that can replace a part of a product. The product cannot function

[534] IRP (2018). *Re-defining Value – The Manufacturing Revolution. Remanufacturing, Refurbishment, Repair and Direct Reuse in the Circular Economy.* Nabil Nasr, Jennifer Russell, Stefan Bringezu, Stefanie Hellweg, Brian Hilton, Cory Kreiss, and Nadia von Gries. A Report of the International Resource Panel. United Nations Environment Programme, Nairobi, Kenya https://www.resourcepanel.org/reports/re-defining-value-manufacturing-revolution

as intended without that part of the product. The functionality of a product is restored or is upgraded when the part is replaced by a spare part.

Substantial contribution to transition to a circular economy

The economic activity complies with one of the following:

A. The economic activity consists of repairing, refurbishing or remanufacturing goods that have been used for their intended purpose before by a customer (household or organisation), complying with the following:

- In case of repair and refurbishment, replaced parts are covered by a sales contract that complies with the requirements of Directive (EU) 2019/771. In particular, these requirements cover conformity of the product, liability of the seller (including the option of a shorter liability or limitation period), burden of proof, remedies for lack of conformity, repair or replacement of the goods, and commercial guarantees, among other requirements.

- In case of remanufacturing, the remanufactured product is covered by a sales contract that complies with the requirements of Directive (EU) 2019/771. In particular, these requirements cover conformity of the product, liability of the seller (including the option of a shorter liability or limitation period), burden of proof, remedies for lack of conformity, repair or replacement of the goods, and commercial guarantees, among other requirements.

- The product's materials and components that have not been reused in the same product are where possible reused elsewhere, or recycled.

B. The economic activity consists of the sale of spare parts beyond legal obligations, complying with the following:

- Each sold spare part is covered by a sales contract that complies with the requirements of Directive (EU) 2019/771. In particular, these requirements cover conformity of the product, liability of the seller (including the option of a shorter liability or limitation

period), burden of proof, remedies for lack of conformity, repair or replacement of the goods, and commercial guarantees, among other requirements.

- Each sold spare part for a product replaces, or intends to replace in future, an existing part in order to restore or upgrade the product's functionality. For example, the existing part may have broken down and thus needs replacement for the product to function properly.

Do no significant harm ('DNSH')

(1) Climate change mitigation	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 gCO_2e/kWh. In case of new parts added as part of repair, refurbishment or remanufacturing, the activity ensures that these changes did not affect negatively the energy efficiency performance of the product.
(2) Climate change adaptation	DNSH as set out in Appendix A of Annex 1 to the Commission Delegated Regulation (EU) …/…
(3) Sustainable use and protection of water and marine resources	DNSH as set out in Appendix 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 Appendix C of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852 Spare parts sold or installed through repair, refurbishment or remanufacturing comply with all relevant EU rules on the restriction of the use of hazardous substances, of generic nature or with specific

	relevance to that product category, such as – but not limited to - REACH legislation, Directive 2011/65/EU, and Directive (EU) 2017/2102. In case of repair or refurbishment activities, the original components that have been retained in the product are excluded from the DNSH criteria above.
(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appendix D of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852

Rationale

DESCRIPTION RATIONALE

Repair, refurbishment and remanufacturing have a direct positive contribution to the circular economy by extending the lifespan of existing goods. Value retention through product lifetime extension is one of the main circular economy strategies. These activities are 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, refurbish and remanufacturing are all in the 9R's strategies before repurpose and recycling, referred to in the European Commission's 'Categorisation System for the Circular Economy', reflecting why it is considered a circular activity by nature. From a circular economy point of view, the activity is always 'low/positive impact'.

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). Hence, to mitigate this risk and manage complexity of this file, the scope has been limited to certain product categories.

Sale of spare parts are equally crucial to facilitate the repair, refurbishment and remanufacturing of products, be it by professional individuals/organisations, or citizens. The product category scope has been kept limited for now as a more granular approach would be needed, requiring time, to ensure substantial contribution and exclude skewed situations once incorporating a broader range of products.

TECHNICAL SCREENING CRITERIA RATIONALE

SC can be achieved by e**xtending lifespan of existing goods through repair, refurbishment and remanufacturing, or through the provision of spare parts.**

The criteria:

- Enable collection of used goods, TR Art 13 (e) & (g)
- Extend product and component lifespan directly, by collecting, reselling and remanufacturing goods, TR Art 13 (e) & (g)
- Reduce the use of primary materials, with % ensuring SC in this regard (closing loopholes), TR Art 13 (a)

2.11 Preparation for re-use of end-of-life products and product components

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 are 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. The preparing for re-use activities are limited to products, and components thereof, that are manufactured by the following activities classified under NACE codes:

- C13 Manufacture of textiles
- C14 Manufacture of wearing apparel
- C15 Manufacture of leather and related products
- C16 Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
- C18 Printing and reproduction of recorded media
- C22 Manufacture of rubber and plastic products
- C23.3 Manufacture of clay building materials
- C23.4 Manufacture of other porcelain and ceramic products
- C25.1 Manufacture of structural metal products
- C25.2 Manufacture of tanks, reservoirs and containers of metal
- C25.7 Manufacture of cutlery, tools and general hardware
- C25.9 Manufacture of other fabricated metal products
- C26 Manufacture of computer, electronic and optical products
- C27 Manufacture of electrical equipment
- C28.22 Manufacture of lifting and handling equipment

- C28.23 Manufacture of office machinery and equipment (except computers and peripheral equipment)
- C28.24 Manufacture of power-driven hand tools
- C28.25 Manufacture of non-domestic cooling and ventilation equipment
- C28.93 Manufacture of machinery for food, beverage and tobacco processing, excluding machinery for tobacco processing
- C28.94 Manufacture of machinery for textile, apparel and leather production
- C28.95 Manufacture of machinery for paper and paperboard production
- C28.96 Manufacture of plastic and rubber machinery
- C29 Manufacture of motor vehicles, trailers and semi-trailers
- C30.1 Building of ships and boats
- C30.2 Manufacture of railway locomotives and rolling stock
- C30.3 Manufacture of air and spacecraft and related machinery
- C30.9 Manufacture of transport equipment n.e.c.
- C31 Manufacture of furniture
- C32 Other manufacturing

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.

- **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.

- **Output of the activity**
  - The output of the activity are products or components of products which are suitable for re-use without any other pre-processing.
  - Sold goods are covered by a sales contract that complies with the requirements of Directive (EU) 2019/771. In particular, these requirements cover conformity of the product, liability of the seller (including the option of a shorter liability or limitation period), burden of proof, remedies for lack of conformity, repair or replacement of the goods, and commercial guarantees, among other requirements.
  - The activity implements a procedure ensuring that waste non-suitable for re-use is recycled.

- **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, EMAS or equivalent 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), or sectoral EU legislation related to waste 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 Appendix 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 Appendix 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 Appendix C of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852 The activity implements safety procedures required to protect the health and safety of workers carrying out preparing for re-use operations (PPC).
(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appendix D of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852

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.

2.12 Sale of second-hand goods

Description of the activity

Description. Included activities are classified under NACE codes:

- G46 Wholesale trade, except of motor vehicles and motorcycles
- G47 Retail trade, except of motor vehicles and motorcycles

in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006, limited to trade in goods produced by the following activities classified under NACE codes:

- C13 Manufacture of textiles
- C14 Manufacture of wearing apparel
- C15 Manufacture of leather and related products
- C16 Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
- C18 Printing and reproduction of recorded media
- C22 Manufacture of rubber and plastic products

- C23.3 Manufacture of clay building materials
- C23.4 Manufacture of other porcelain and ceramic products
- C25.1 Manufacture of structural metal products
- C25.2 Manufacture of tanks, reservoirs and containers of metal
- C25.7 Manufacture of cutlery, tools and general hardware
- C25.9 Manufacture of other fabricated metal products
- C26 Manufacture of computer, electronic and optical products
- C27 Manufacture of electrical equipment
- C28.22 Manufacture of lifting and handling equipment
- C28.23 Manufacture of office machinery and equipment (except computers and peripheral equipment)
- C28.24 Manufacture of power-driven hand tools
- C28.25 Manufacture of non-domestic cooling and ventilation equipment
- C28.93 Manufacture of machinery for food, beverage and tobacco processing, excluding machinery for tobacco processing
- C28.94 Manufacture of machinery for textile, apparel and leather production
- C28.95 Manufacture of machinery for paper and paperboard production
- C28.96 Manufacture of plastic and rubber machinery
- C29 Manufacture of motor vehicles, trailers and semi-trailers
- C31 Manufacture of furniture
- C32 Other manufacturing

Substantial contribution to transition to a circular economy

The economic activity consists of selling second-hand goods that have been used for their intended purpose before by a customer (household or organisation), possibly after repair, refurbishment and/or remanufacturing, and complies with the following:

- The sold product is covered by a sales contract that complies with the requirements of Directive (EU) 2019/771. In particular, these requirements cover conformity of the product, liability of the seller (including the option of a shorter liability or limitation period), burden of proof, remedies for lack of conformity, repair or replacement of the goods, and commercial guarantees, among other requirements.

- If the product has been repaired, refurbished and/or remanufactured before reselling, the product's materials and components that have not been reused in the same product are where possible reused elsewhere, or recycled.

Do no significant harm ('DNSH')

(1) Climate change mitigation	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 gCO_2e/kWh. In case of new parts added as part of repair, refurbishment and/or remanufacturing, the activity ensures that these changes did not affect negatively the energy efficiency performance of the product. In case the product sold is initially produced by the activities classified under NACE codes C29, the product complies with Regulation (EU) 2019/1242 or any later amending version thereof. In case the product sold is initially produced by the activities classified under NACE codes C26 or C27, the product complies with Directive 2009/125/EC and any of its related implementing regulations or any later amending version thereof.
(2) Climate change adaptation	DNSH as set out in [Appendix A of Annex 1 to the Commission Delegated Regulation (EU) …/…]
(3) Sustainable use and protection of water and marine resources	DNSH as set out in Appendix 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 Appendix C of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852

	In case the product sold is initially produced by the activities classified under NACE codes C29, the product complies with the Commission Regulation (EU) 2016/646 or any later amended version thereof.
(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appendix D of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852

Rationale

DESCRIPTION RATIONALE

Reselling used goods is crucial for keeping products in the economy, hence reducing the need for virgin & secondary materials, and retaining their value.

TECHNICAL SCREENING CRITERIA RATIONALE

- Average goods lifespan gets shortened through lack of resale, leading to working goods being wasted in a linear throughput model
- SC can be achieved by **extending lifespan of existing goods items through reselling**, possibly after repair, refurbishment and/or remanufacturing
- Guarantee periods based on relevant EU legislation (Directive (EU) 2019/771)).
- Potential loopholes or unintended activities (like selling overstock) are being closed by requiring '*[...] second-hand goods that have been used for their intended purpose before by a customer (household or organisation), [...]*', so products must have been used before and the activity truly is about keeping these products in use for longer. The risk of products being sold rather quickly (compared to average use period) is deemed to be limited for simple business/market reasons: one has limited to no incentive to sell a product that is in perfect shape (and that is used in / needed for business/household activities) only to buy a new similar one at a higher price (if it were not higher, one wouldn't be able to sell initial one). Especially doing so at scale just to get a green label for those revenues seems far-fetched. Also important to note that the activity only

covers professionals selling of second-hand goods as part of their activities, not common citizens selling their second-hand goods in a peer-to-peer way.

- DNSH criteria ensure that in case of new parts added as part of repair, refurbishment and/or remanufacturing, these changes do not negatively affect the energy efficiency performance of the product. Additional DNSH are provided for product categories that can be energy intense, in particular products manufactured by NACE code activities C26 & C27, and by C29. As such, the substantial contribution to the circular economy of keeping products, including cars, in use is recognised ("keeping product and resources in the economy"), while ensuring no harm to other environmental objectives, such as climate change mitigation. In addition, energy efficiency and moving to renewable energy can address 55% of global GHG emissions[535]. To address the remaining 45% of emissions we also need to transform how we design, make, and use products and food. That is exactly where the circular economy has an important role to play, for example, by keeping energy embedded in materials and products in the economy, and so reduce energy demand. Hence while older less energy-efficient products might lead to more emissions during the use phase, compared to using new more efficient products, the GHG emissions picture considering the entire product lifecycle (i.e., extraction of materials, production and waste management) often looks different - a case that gets reinforced when taking additional negative environmental impact of extraction and production into account.
- The criteria:
    - Enable collection of used goods, TR Art 13 (e) & (g)
    - Extend product and component lifespan directly, by collecting, reselling and remanufacturing goods, TR Art 13 (e) & (g)
    - Reduce the use of primary materials, with % ensuring SC in this regard (closing loopholes), TR Art 13 (a)

[535] Ellen MacArthur Foundation, Material Economics, *Completing the picture: How the circular economy tackles climate change (2019)*

2.13 Product-as-a-service and other circular use- and result-oriented service models

Description of the activity

The scope includes economic activities that are classified under but not limited to NACE code 77 Rental and leasing activities, providing customers (household or organisation) with access to products through service models, with limitation to products that are manufactured by the following activities classified under NACE codes:

- C13 Manufacture of textiles
- C14 Manufacture of wearing apparel
- C15 Manufacture of leather and related products
- C16 Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
- C22 Manufacture of rubber and plastic products
- C23.3 Manufacture of clay building materials
- C23.4 Manufacture of other porcelain and ceramic products
- C25.1 Manufacture of structural metal products
- C25.2 Manufacture of tanks, reservoirs and containers of metal
- C25.7 Manufacture of cutlery, tools and general hardware
- C25.9 Manufacture of other fabricated metal products
- C26 Manufacture of computer, electronic and optical products
- C27 Manufacture of electrical equipment
- C28.22 Manufacture of lifting and handling equipment
- C28.23 Manufacture of office machinery and equipment (except computers and peripheral equipment)
- C28.24 Manufacture of power-driven hand tools
- C28.25 Manufacture of non-domestic cooling and ventilation equipment
- C28.93 Manufacture of machinery for food, beverage and tobacco processing, excluding machinery for tobacco processing
- C28.94 Manufacture of machinery for textile, apparel and leather production
- C28.95 Manufacture of machinery for paper and paperboard production
- C28.96 Manufacture of plastic and rubber machinery
- C31 Manufacture of furniture
- C32 Other manufacturing

These service models can be[536]:

- Either use-oriented services, where the product is still central, but its ownership remains with the provider and the product is leased, shared, rented or pooled;
- Or result-oriented, where payment is by pre-defined and agreed result, i.e., pay per service unit delivered.

Substantial contribution to transition to a circular economy

The economic activity complies with the following:

1. The activity provides the customer (household or organisation) with access to and use of product(s), while ensuring the ownership remains with the company providing this service, such as a manufacturer, specialist or retailer. The contractual terms and conditions ensure that all the following points are met:

- There is an obligation for the provider of the service to take back the used product at the end of the contractual agreement;
- There is an obligation for the customer to give back the used product at the end of the contractual agreement;
- The provider of this service remains owner of the product;
- The customer pays for access to and use of the product, or the result of access to and use of this product.

2. The activity leads to extended lifespan and/or increased use intensity of the product in practice. The product offered through this activity complies with one of the following:

- A lifespan of at least twice the EU average for that product category, accounting for differences between B2B and B2C contexts, under the condition of an average use intensity;
- A use intensity of at least twice the EU average for that product category, accounting for differences between B2B and B2C contexts, under the condition of an average lifespan;

[536] For additional information on these definitions, see e.g., Tukker, A. (2015) *Product services for a resource-efficient and circular economy – a review*, Journal of Cleaner Production, Vol.97, pp.76-91, https://doi.org/10.1016/j.jclepro.2013.11.049

- A combination of extended lifespan and increased use intensity, such that 'lifespan times use intensity' is at least twice the EU average, accounting for differences between B2B and B2C contexts.

Do no significant harm ('DNSH')

(1) Climate change mitigation	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 gCO_2e/kWh.
(2) Climate change adaptation	DNSH as set out in [Appendix A of Annex 1 to the Commission Delegated Regulation (EU) …/…]
(3) Sustainable use and protection of water and marine resources	DNSH as set out in Appendix 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 Appendix 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 Appendix D of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852

Rationale

DESCRIPTION RATIONALE

Starting from individual product categories across sector teams (e.g., electronic goods, electrical equipment, furniture, wearing apparel), the TWG has expanded this scope to cover a broad range of products of which the manufacturing NACE codes are given by the list provided. In future, this list could be expanded with other product categories, under the assumption that new categories do not pose conflicts with existing Taxonomy criteria or other environmental objectives. For example, motor vehicles and other means of transport have not been included: they are already dealt with in the first Delegated Act on climate change, (so Taxonomy alignment can be obtained); and inclusion here would create technical difficulties (e.g., turning TSC thresholds for SC towards CCM into DNSH for CCM), fail to ensure SC to CE (e.g., the likelihood of rented cars in tourist places rather driving demand than replacing additional cars), or allow for criteria shopping between environmental objectives (e.g., existing car rental businesses offering combustion engine cars not meeting the CCM criteria).

TECHNICAL SCREENING CRITERIA RATIONALE

General

Average product lifespan gets shortened as current business models supporting linear take-make-waste throughput model.

SC can be achieved by **extending lifespan and/or increasing use intensity of products through circular business models.** When ownership remains with the manufacturer / retailers / specialist company, 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 and/or increased use intensity in practice has been added.
- The criteria:
    - Enable collection of used products, 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)

3. Energy

3.1 Environmental refurbishment of 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 which demonstratively mitigate the environmental impacts of existing hydropower plants, which may incorporate modernisation of structures, operation modes and equipment, and/or introduction of new technologies, devices or solutions, including nature-based. Environmental refurbishment also includes activities to restore the lost and/or degraded habitats of rivers at the river basin scale.

Substantial contribution to protection and restoration of biodiversity and ecosystems

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The environmental refurbishment needs to fulfil all of the following criteria:

1. All the Technical Screening Criteria listed in Chapter 9.2 (Restoration of biodiversity and ecosystem) of this Annex are fulfilled. In addition, the following conditions apply.

1.1 The Restoration Plan or equivalent instrument, as detailed in Criteria 1 of Chapter 9.2, of this Annex demonstrates that the environmental refurbishment contributes to the improvement of the Status of the Water Body where the plant is located (as defined by the Water Framework Directive, Annex V) and does not compromise the achievement of good status/potential by 2027* in any of the water bodies in the same river basin district.

1.2 In accordance with Article 4 of Directive 2000/60/EC and Criteria 4.2 of Chapter 9.2 (Restoration of biodiversity and ecosystem) of this Annex, the Restoration Plan assesses

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all potential impacts of the environmental refurbishment on the status of water bodies within the same river basin and on protected habitats and species directly dependent on water, considering 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 environmental refurbishment with other existing or planned infrastructure in the river basin.

1.3 The Restoration Plan or equivalent instrument, as detailed in Criteria 1 of Chapter 9.2 of this Annex, includes, but is not limited to, measures to ensure upstream and downstream fish migration (such as fish passes, adapted turbines, fish guidance structures with adjacent bypass, measures to stop or minimise operation and discharges during migration or spawning, etc.) that allow for a vast majority (>85%) of individuals from each migratory species to swim safely through and/or past the hydropower plant; creation of nature-like fishways, creation of reproduction channels or off-channel habitats, restoration of the riparian zone or riverbank vegetation, measures to prevent erosion and ensure slope stability, measures to ensure sediment flow and, depending of ownership and property rights, removal of obsolete barriers in the river basin district, starting no later than the environmental refurbishment. 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.

A sound monitoring system is in place to demonstrate the effectiveness of the measures in accordance with the Restoration Plan or the equivalent instrument and in particular the contribution to the reduction of losses in freshwater species populations (in particular, migratory fish) at the hydropower station and further upstream/downstream and the improvement in other biological quality elements listed in Directive 2000/60/EC and where relevant, Directive 92/43/EEC12. Key monitoring results are available to the public.

2. The environmental refurbishment is conducted on hydropower plants having a capacity above 10 MW.

3. Retrofitting aiming at the conversion into hydropower plants of barriers built or used for other purposes, or not in use anymore at the time of the environmental refurbishment, is not eligible.

*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	The direct GHG emissions from the generation of electricity from hydropower are lower than 270gCO_2e/kWh.
(2) Climate change adaptation	DNSH as set out in Appendix 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	1. An Environmental Impact Assessment or screening of the environmental refurbishment has been completed in accordance with Criteria 4.2 (Additional minimum requirement) of Chapter 9.2 (Restoration of biodiversity and ecosystem) of this Annex. This assessment is streamlined with the assessment required in the Restoration Plan, as prescribed in the substantial contribution criteria 1, in accordance with the Commission guidance document (2016/C 273/01) on streamlining environmental assessments. 2. The design of the environmental refurbishment project is adapted to reflect the results of the assessments mentioned in paragraphs 1 and in the substantial contribution criteria. In particular, the height of the hydropower dam or weir and the overall volume of water used are not increased as a result of the environmental refurbishment if the assessments have showed that those affect the water status or the habitats and species listed in Directive 92/43/EEC12.

	3. The design of the environmental refurbishment project complies with existing legal requirements on minimum ecological flows and hydropeaking. 4. The activity complies with Criteria set out in Appendix B to Annex I to C (2021)2800
(4) Transition to circular economy	N/A
(5) Pollution prevention and control	N/A

Rationale

Why the activity is included

This activity includes only the environmental refurbishment of hydropower plants and therefore covers only one part of the activity 4.5 under delegated act C/2021/2800 final. This is because the construction and operation of hydropower plants are not making a substantial contribution to the objective of protection and restoration of biodiversity and ecosystems by themselves due to their massive impacts on freshwater habitats and species resulting from increased river fragmentation, even in the case of small hydropower plants. “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.”, and even though the purpose of many barriers is reported as unknown, 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, The Living Planet Index (LPI) for migratory freshwater fish, 2020).

Given the high number and impacts of river barriers on freshwater biodiversity status, the construction and operation of hydropower plants, even with some mitigation measures, cannot qualify as making a substantial contribution towards the objective of protection and restoration of biodiversity and ecosystems because constructing new barriers and/or operating them does not in itself reduce pressures on biodiversity. The European Commission states that “the modernisation of existing hydropower plants should therefore be prioritised over the construction of new ones, to improve their ecological footprint” (European Commission, Guidance on the requirements for hydropower in relation to EU Nature legislation, 2018).

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, as this activity directly supports the reduction of the environmental impact of hydropower plants.

How the activity can make a contribution

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.).

Nature of the substantial contribution

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.

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 (which are rather do-no-significant-harm considerations), 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 ambition).

Types of criteria

Criteria 1 frames the environmental refurbishment of hydropower as an activity which enables restoration. The environmental refurbishment entails the implementation of measures aimed at mitigating the harmful effects of hydropower plants on habitats and restoring the natural habitat function of rivers at the river basin scale. For consistency purposes, these measures need to fullfill the Techincal Screening Criteria detailed in Chapter 9.2 on Restoration of biodiversity and ecosystem.

Criteria 1.1 and 1.2 introduces some specific assessments to be included in the Restoration Plan for the environmental refurbishment. These are impact-based criteria referring to the achievement/maintenance of good ecological status/potential in accordance with the Water Framework Directive without possibilities of derogations provided under article 4(7). Criteria 1.1 and 1.2 are therefore additional to the Water Framework Directive.

Criteria 1.3 lists, as a matter of example, measures aiming at covering the wide range of impacts of hydropower plants on species and habitats, which should be included in the Restoration Plan required by the Techical Screening Criteria mentioned in chapter 9.2. Research shows that hydropower has multiple impacts (river fragmentation and impoundments due to barriers, modified flows and habitat conditions, changes in water temperature), that require various mitigation and restoration measures (FIThydro project, Policy Brief). Even though the type of measure chosen will very much depend on the ecological condition of the body of water in question, the type of hydropower facility present, other pressures and threats, those measures aim to reflect the main impacts on the ecosystem as described by the literature - direct impact on fish mortality; impact on flow conditions; impact on habitats and

other physical factors (European Commission, Guidance on the requirements for hydropower in relation to EU Nature legislation, 2018, p.34 ; FIThydro project, Policy Brief).

These measures aim at restoring lost and/or degraded habitats. The most direct impact of hydropower plants to freshwater biodiversity is on fish migration. Measures to improve fish passage are one way to address it. The European Commission recommends ensuring "that the device makes it possible for all riverine species to enter the pass and that the vast majority (e.g., 85%) can also exit alive". (European Commission, Guidance on the requirements for hydropower in relation to EU Nature legislation, 2018, p.37). Research on fish guidance structures demonstrates that 70-80% of the fish find their way past the power plant intake due to those structures, and work is ongoing to achieve an objective of at least 90% to swim safely past the plant (Turbulent eddies to save fish from turbines, https://storymaps.arcgis.com/stories/f9e8c4ff1c8849fb874176adbb17fb0b, consulted on 24 November 2021). Compared to well-developed upstream fish migration technologies, design standards for downstream fish protection and guidance technologies are lacking but fish-friendly turbines and fish guidance structures with adjacent bypass are acceptable solutions to limit the mortality of fish at a hydropower plant (FIThydro, List of solutions, models, tools and devices, their application range on a regional and overall level, the identified knowledge gaps and the recommendations to fill these,2018, p.87).

The European Commission recommends "not only that the fish pass or adapted turbine is built according to state-of-the-art developments in this sector and current best practices, but also that a sound monitoring system is in place to provide feedback on its effectiveness." (European Commission, Guidance on the requirements for hydropower in relation to EU Nature legislation, 2018).

Criteria 2 introduces a capacity (>10MW) threshold for eligible hydropower plantsintended to complement the other substantial contribution criteria proposed and address specifically the cumulative effects of multiple hydropower plants. This threshold is set based on the following considerations:

- Small hydropower plants have higher environmental impacts per kWh (Katharina Lange et. al., Hydropower goes unchecked, June 2019, Frontiers in Ecology and the Environment 17(5):256-258; Kelly-Richards, S., Silber-Coats, N., Crootof, A., (2017). Governing the transition to renewable energy: A review of impacts and policy issues in the small hydropower boom. Energy Policy, 101, 251–264) and therefore cannot meet the same ambition of a substantial contribution to protection and restoration of

biodiversity and ecosystems. Small plants are the ones that are generating the majority of cumulative effects. "A major impact on a river may arise from a single, very damaging large structure or from the cumulative effects throughout the course of the river of a series of small structures, each of which may have only a small impact individually" (EEA Briefing, Tracking barriers and their impacts on European river ecosystem, 2021). In Germany for instance, due to their high number, the more than 7,800 small hydropower plants with a maximum capacity of less than 1 megawatt seriously affect the ecological condition of about one third of German watercourses (IGB Berlin, 2021). Research on salmon smolts on the Allier river in France shows loss rates of 2.5-7.5% of smolts at each hydropower plant, although equipped with high or very high-performance migration aids (Association for salmon protection in Loire-Allier, 2021). This means that depending on the initial fish stock, there is a limit in the number of hydropower installations – even equipped with the best migration aids - which a river basin can sustain to maintain its migratory fish population.

- Most small hydropower plants are run-of-river plants, either diversion schemes, with (pondage) or without (diversion weir) storage, more common in medium or highland rivers, or non-diversion schemes (also called dam-toe) mostly in lowland rivers. The most common reported ecological impacts are: flow regime alteration, water depletion in the bypass reach, loss of longitudinal connectivity, fish injuries, habitat degradation, and fish or macroinvertebrates community composition simplification. (Kuriqi, A., Pinheiro, A. N., Sordo-Ward, A., (2021). Ecological impacts of run-of-river hydropower plants—Current status and future prospects on the brink of energy transition. Renewable and Sustainable Energy Reviews, 142, 110833)
- Small hydropower plants in Europe are most of the time located in more pristine and ecologically diverse habitats (Kuriqi, A., Pinheiro, A. N., Sordo-Ward, A (2021). Ecological impacts of run-of-river hydropower plants—Current status and future prospects on the brink of energy transition. Renewable and Sustainable Energy Reviews, 142, 110833), so in those particular biodiversity hotspots a reduction of the environmental impact might not be sufficient. Because of their location, the biodiversity substantial contribution that could be expected is their dismantling instead of their refurbishment. Their dismantling is also a more likely alternative (for ageing plants at least) than for larger hydropower plants (Habel, M., Mechkin, K., Podgorska, K. et al. Dam and reservoir removal projects: a mix of social-ecological trends and cost-cutting attitudes. Sci Rep 10, 19210 (2020)).
- As a threshold, 10 MW is the most commonly used one in Europe and across international agencies to define small hydropower plants (Kelly-Richards, S., Silber-

Coats, N., Crootof, A., (2017). Governing the transition to renewable energy: A review of impacts and policy issues in the small hydropower boom. Energy Policy, 101, 251–264).

Criteria 3 excludes the construction of new hydropower plants including on pre-existing structures such as abandoned barriers or barriers used for other purposes.

- Hydropower production is not of the same nature as the activity of the pre-existing structures (i.e., old mills) and does not require the same equipment.The redevelopment of very old structures is most of the time accompanied by modifications (raising the weir, increasing the flow taken, installing a larger inlet channel in the river's minor bed, etc.) which lead to increased impacts on the aquatic environment (RESTOR Hydro handbook, 2015).
- The RESTOR Hydro project identifies 50,000 structures in Europe that could be potentially repowered. Incentivising the repowering of those structures would add to the fragmentation of rivers, in contradiction to the EU Biodiversity Strategy commitment to restore free-flowing rivers.

4. Civil engineering

4.1 Civil engineering

Description of the activity

The new construction or reconstruction of civil engineering objects.

New construction or reconstruction of pedestrian walkways and bicycle lanes, including bridges and tunnels; of railways and subways, including bridges, tunnels, stations and terminals; of motorways, streets, roads, including bridges and tunnels; airfield runways, waterways, pleasure ports, dams and dykes; and harbour and rivers works.

The activities are classified under NACE code F42 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006. They could be associated with several NACE codes, in particular F42.11, F42.12, F42.13, F42.91 and F42.99. Depending on the type of contract and the specific project in question, demolition activities as classified under NACE code F43 could be included in the scope of this activity.

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[537] 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[538], scientific peer-reviewed publications and open source[539] 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;

[537] Future scenarios include Intergovernmental Panel on Climate Change representative concentration pathways RCP2.6, RCP4.5, RCP6.0 and RCP8.5.

[538] 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/.

[539] Such as Copernicus services managed by the European Commission.

(b) favour nature-based solutions[540] or rely on blue or green infrastructure[541] 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.

[540] 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/).

[541] 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.
2) Climate change adaption	DNSH as set out in Appendix 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	The activity complies with DNSH as set out in Appendix 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[542],

[542] WasteFD 2008/98/EC

	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 o 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 o 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 biodiversity and ecosystems	DNSH as set out in Appendix D of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852. In addition the following requirements must be observed: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.[543]
- 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.[544]

[543] page 216 in https://www.eea.europa.eu/publications/soer-2020

[544] https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_wastrt&lang=en

4.2 Maintenance of roads and motorways

Description of the activity

Maintenance of streets, roads and motorways 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. The maintenance operation is mainly dedicated to pavement management and concerns only the following main elements of the road: binder course and surface course and concrete slabs. The roads in the scope of this activity are made of asphalt, concrete or asphalt concrete.

The activity could be linked to construction of roads and motorways classified under NACE code F42.11 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 the following criteria:

1. Where main road elements (binder course and/or surface course or concrete slabs) are demolished or removed, 100% (by weight) of the non-hazardous waste [excluding naturally occurring material referred to in category 17 05 04 (soil and stones) in the European List of Waste established by Commission Decision 2000/532/EC479] is prepared and collected with the aim of subsequent for re-use and recycling, excluding backfilling and landfilling.

2. Use of secondary materials

Where road elements are newly installed after demolition or removal, at least 50% (by weight) of the materials used are recycled, re-used or re-manufactured materials and/or by-products.

Deviation from the 50% target is justified

- For a period of 2 years from the adoption of the Delegated Act*, where the use of recycled materials to such extent is not in accordance with national regulations as long as the maximum allowed threshold is reached.
- **or** where the use of recycled content, re-used content, re-manufactured content and/or by-products leads to higher CO_2 emissions than the use of virgin material. This is proven by calculating and comparing the CO_2 emissions generated through the production processes and the transportation of the recycled or re-used material with the CO_2 emissions generated through the production process and the transportation of virgin material.[545]

3. Durability

Where newly installed, the binder course has a service lifetime no shorter than 20 years.

* Note: After 2 years from the adoption of the Delegated Act has passed, this allowance will no longer be valid grounds for deviation from the target.

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 Appendix 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 Appendix 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 Appendix D of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852

Rationale

1) Substantial contribution by maintenance (by nature of activity)

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

[545] The calculation is based on EN 17472 *(waiting for publication, accepted in CEN formal vote)*, and refers to the lifecycle stages A1 to A4.

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 (var) 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). **The simulation below illustrates the material savings (right column – bitumen in tons) achieved through maintenance.**

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 IR	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

- 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.
- 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 (European Asphalt Pavement Association – Asphalt the 100% recyclable construction product, p. 4).

- The most significant environmental impacts of road maintenance are material production when a maintenance activity leads to the renewal of road elements (EU Green Public Procurement criteria for road design, construction and maintenance, pp. 5-6) 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 as well as the scope of the activity are partly based on the comprehensive requirements of the EU Green Public Procurement Criteria for road design, construction and maintenance.
- The 100% recycling/re-use rate for waste is chosen because non-hazardous materials used in the upper layers of roads can be entirely recycled, and sometimes reused (European Asphalt Pavement Association – Asphalt the 100% recyclable construction product, p. 9 & European Concrete Paving Association – Factsheet 100% recycling, p.2)
- The 50% content is selected based on the ambition in the EU to double the circular material use rate by 2030 (Circular Economy Action Plan 2020, p.4):
    - The current (2016) rate for non-metallic minerals stands at around 15% (Eurostat)
    - the production of recycled aggregates represents 11,4% of the total aggregate production in the EU and EFTA (European Aggregates Industry – Annual Report 2020/2021, p. 17)
    - Aggregates are used as a reference because they are raw materials which are predominantly used in the manufacture of construction products used for road construction such as ready mixed concrete (made of 80% aggregates) and asphalt products (made of 95% aggregates)
    - aggregates are also end-products used in road construction, e.g., in sub-layers of roads.
    - Concerning asphalt, the share of recycled asphalt in total asphalt production differs significantly across the EU and ranges from 41% (Czech Republic) to 2% (Hungary) (own calculations based on European Asphalt Pavement Association – Asphalt in Figures 2019, tables 1 and 6)
- The condition that the use of recycled material must be in accordance with national regulations is necessary because in some countries, recycled content in construction products is not permitted or might be subject to a maximum value (%) depending on the use and the exposure of the construction element in question. In such cases we consider it unfair to penalise companies or to incentivise them to breach these regulations.

Since not all member states have such restrictions, it is reasonable to expect that in many cases, the technical viability of increased use of secondary material is already demonstrable or can be improved to make it viable. It is important that standards and regulations should be reviewed and, wherever possible revised to encourage, or not be a barrier to, greater circularity in the sector. Hence a 2-year time limit is applied to this permitted deviation from the targets. This will ensure that there is opportunity to review and revise national regulations and standards wherever possible and there can be an alignment of ambition levels over time between member states.

- 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 the lack of regionally available recycled materials.

- DNSH
    - 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. The remaining DNSH are taken over from the first delegated act as these already reflect the risks that can be associated to the activity.

5. Buildings

5.1 Construction of new buildings

Description of the activity

Construction of new 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.

Development of building projects for residential and non-residential buildings by bringing together financial, technical, and physical means to realise the building projects for later sale as well as the construction of complete residential or non-residential buildings, on own account for sale or on a fee or contract basis.

The economic activities in this category could be associated with several NACE codes, in particular F41.1 and F41.2, including also activities under F43, 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 the following criteria:

1. All generated construction and demolition waste is treated in accordance with the checklist of the EU Demolition and Construction Waste Protocol and at least 90 % (by weight) of the non-hazardous construction and demolition waste 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. This should be demonstrated with reference to Level(s) indicator 2.2 (construction and demolition waste and materials) with the Level 3 reporting format for different waste streams.

2. A life cycle assessment[546] of the entire building has been calculated according to Level(s) and EN 15978, covering each stage in the life cycle and the results are made publicly available.
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[547] and recycling[548]. This should be demonstrated with reference to Level(s) indicators 2.3[549] (design for adaptability) and 2.4[550] (design for deconstruction) at Level 2, in accordance with ISO 20887:2020, EN 15643, and EN 16309.
4. The asset comprises at least 50% (either by weight or by surface area of building elements including facades, roofs and internal walls and floors) from a combination of re-used components, recycled content, or responsibly-sourced renewable materials. The 50% should be reached with the following criteria:
    - Minimum 15% comes from re-used components,
    - Minimum 15% comes from recycled content,
    - The remaining 20% may be met by either re-used or recycled content or by responsibly sourced, renewable materials or any combination of these three.

[546] The GWP is communicated as a numeric indicator for each life cycle stage expressed as $kgCO_2e/m2$ (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.

[547] Reuse is defined as the operation by which a product, or a part thereof, having reached the end of one use stage is used again for the same purpose for which it was conceived. https://susproc.jrc.ec.europa.eu/product-bureau/sites/default/files/2021-01/UM3_Indicator_2.4_v1.1_18pp.pdf

[548] Recycling is defined as any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes. https://susproc.jrc.ec.europa.eu/product-bureau/sites/default/files/2021-01/UM3_Indicator_2.4_v1.1_18pp.pdf

[549] 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

[550] https://susproc.jrc.ec.europa.eu/product-bureau/sites/default/files/2021-01/UM3_Indicator_2.4_v1.1_18pp.pdf

Any responsibly sourced, renewable materials used in the building (regardless of whether these count towards the 50% target or not) must meet the following requirements:

a. 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.

b. 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.

5. Components and materials used in the construction do not contain asbestos nor substances of very high concern as identified on 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.
6. Electronic tools are used to describe the characteristics of the building as built, including the materials and components used, for the purpose of future maintenance, recovery, and reuse. The information is stored in a digital format and is made available to the client.

Do no significant harm ('DNSH')	
(1) Climate change mitigation	*DNSH as set out for this activity in Annex 2 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852*
(2) Climate change adaptation	DNSH as set out in Appendix 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 Appendix 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 Appendix 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 Appendix 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 Appendix 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[551]). No specific figures for renovations are available. However, an important share can be presumed as renovation works represents around 40% of investment in construction (FIEC Statistical Report). Given the need for a renovation wave, the material consumption for renovations can be expected to increase in the coming years.

Construction of buildings **generates significant amounts of waste**. Overall, construction generates 35% of the EU’s total waste.[552]

- 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 82.8% of the treated mineral construction and demolition waste.[553] 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.
- 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.
- 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

[551] https://www.circularity-gap.world/2021#downloads

[552] Eurostat

[553] European Environmental Agency

transported over long distances and/or, for instance, the use of recycled aggregates requires a higher share of cement in concrete.

- Increasing the maintainability/recyclability/re-usability is promoted 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
- 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.
- Incentivising the use of widely recognised tools (LCA) to evaluate the lifecycle impacts and ensuring this data is available publicly to facilitate improved benchmarking and target setting at asset, portfolio or even national and European level.[554]
- Improving resource efficiency at the design stage by applying circularity principles and by using recycled or re-used content. The 50% content is selected based on the ambition in the EU to at least double the circular material use rate by 2030 (CEAP, 2020), [555] and the EU call to "secure at least a doubling of resource productivity as compared with the pre-crisis trend; equivalent to an increase of well over 30% by 2030". [556] Therefore, in order to comply with this EU circularity ambition, a 50% target is selected as making a substantial contribution.
- Circular material uses can be achieved for both finite and renewable / bio-based materials and the approaches for each may differ.[557] Recognising this and recognising that the waste hierarchy prioritises reuse over recycling, the criteria are designed to ensure that a combination of approaches (reuse, recycling and renewable materials) is adopted rather than allowing only one of these strategies to meet the full 50% criterion.

The distribution of the percentage is based on the principles to achieve lower environmental footprint materials in the building environment: (i) keeping construction products and

[554] OneClickLCA (2020) Embodied carbon benchmarks for European buildings, https://www.oneclicklca.com/eu-embodied-carbon-benchmarks

[555] The current (2016) rate for non-metallic minerals stands at around 15%: page 216 in https://www.eea.europa.eu/publications/soer-2020

[556] Towards a circular economy: A zero waste programme for Europe

[557] Eg. See Ellen MacArthur Foundation 'Butterfly Diagram' which shows how a circular economy can include both technical loops for finite materials and natural loops for renewable materials.

materials in use and at their highest value , (ii) maximising recycled content, so that the use of primary resources can be minimised, and (iii) regenerating natural systems by promoting use of responsibly sourced renewable materials that can be returned to the natural environment (such as biodegradable products).[558] [559] Such principles are also supported by the EU Circular Economy Action Plan, which states that "Biological resources are a key input to the economy of the EU and will play an even more important role in the future. The Commission will aim at ensuring the sustainability of renewable bio-based materials, including through actions following the Bioeconomy Strategy and Action Plan". [560]

The importance of both secondary materials and responsibly sourced renewable materials, as key factors to achieve circularity within the EU economy has been recognized by numerous sources. For instance, the Circularity Gap Report (2021) recognises the need to focus on secondary materials flows and also how utilisation of 'natural or renewable building materials […] help regenerate flows.' [561], while the State of Play for Circular Built Environment in Europe (2020), together with other studies, shows how building projects with responsibly sourced renewable materials are key within the circular economy principles as they have small carbon footprints and big carbon handprints. [562] [563] [564] [565] [566] [567] The contribution of renewable materials to circularity are recognised in numerous European Commission policies.[568] [569] [570]

[558] https://ellenmacarthurfoundation.org/topics/circular-economy-introduction/overview

[559] https://www.rockwool.com/group/advice-and-inspiration/blog/circularity-in-building-and-construction-products/

[560] https://ec.europa.eu/environment/pdf/circular-economy/new_circular_economy_action_plan.pdf

[561] Circularity Gap Report 2021: https://www.circularity-gap.world/2021

[562] State of Play for Circular Built Environment in Europe (2020)

[563] Switching the load-bearing structure from the conventionally used concrete to massive timber can lower a building's emissions by 34–84% (Skullestad et al. 2016): High-rise Timber Buildings as a Climate Change Mitigation Measure: A Comparative LCA of Structural System Alternatives

[564] https://www.pik-potsdam.de/en/news/latest-news/buildings-can-become-a-global-co2-sink-if-made-out-of-wood-instead-of-cement-and-steel

[565] https://mediatum.ub.tum.de/doc/1175337/file.pdf

[566] https://efi.int/sites/default/files/files/publication-bank/2018/efi_hurmekoski_wood_construction_2017_0.pdf

[567] 2020 Global Status Report for Buildings and Construction: https://globalabc.org/sites/default/files/inline-files/2020%20Buildings%20GSR_FULL%20REPORT.pdf

[568] https://ec.europa.eu/environment/strategy/forest-strategy_en

[569] https://ec.europa.eu/environment/strategy/forest-strategy_en

[570] https://ec.europa.eu/clima/eu-action/forests-and-agriculture/sustainable-carbon-cycles_en

5.2 Renovation of existing buildings

Description of the activity

Renovation of existing buildings.

The economic activities in this category could be associated with several NACE codes, in particular F41 and F43 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 the following criteria:

1. All generated construction and demolition waste is treated in accordance with the checklist of the EU Demolition and Construction Waste Protocol and at least 90 % (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 Commission Decision 2000/532/EC479) generated on the construction site is prepared for re-use or recycling. This should be demonstrated with reference to Level(s) indicator 2.2 (construction and demolition waste and materials) with the Level 3 reporting format for different waste streams.
2. A life cycle assessment[571] of the entire renovation works has been calculated according to Level(s) and EN 15978, covering each stage in the life cycle and the results are made publicly available.
3. Construction designs and techniques support circularity and, in particular, demonstrate how they are designed to be more resource efficient, adaptable, flexible

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[571] The GWP is communicated as a numeric indicator for each life cycle stage expressed as $kgCO_2e/m2$ (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.

and easy to dismantle to enable reuse[572] and recycling[573]. This should be demonstrated with reference to Level(s) indicators 2.3[574] (design for adaptability) and 2.4[575] (design for deconstruction) at Level 2, in accordance with ISO 20887:2020, EN 15643, and EN 16309.

4. At least 50% of original building is retained. This can be calculated based on the combined total surface area of all elements (facades, roofs, internal walls and floors but excluding landscaping and groundworks).
5. The asset comprises at least 50% (either by weight or by surface area of building elements including facades, roofs and internal walls and floors) from a combination of re-used components, recycled content, or responsibly-sourced renewable materials. The 50% should be reached with the following criteria:

    - Minimum 15% comes from re-used components,
    - Minimum 15% comes from recycled content,
    - The remaining 20% may be met by either re-used or recycled content or by responsibly sourced, renewable materials or any combination of these three.

Any responsibly sourced, renewable materials used in the building (regardless of whether these count towards the 50% target or not) must meet the following requirements:

a. 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.

b. 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

[572] Reuse is defined as the operation by which a product, or a part thereof, having reached the end of one use stage is used again for the same purpose for which it was conceived. https://susproc.jrc.ec.europa.eu/product-bureau/sites/default/files/2021-01/UM3_Indicator_2.4_v1.1_18pp.pdf

[573] Recycling is defined as any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes. https://susproc.jrc.ec.europa.eu/product-bureau/sites/default/files/2021-01/UM3_Indicator_2.4_v1.1_18pp.pdf

[574] 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

[575] https://susproc.jrc.ec.europa.eu/product-bureau/sites/default/files/2021-01/UM3_Indicator_2.4_v1.1_18pp.pdf

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.

6. Components and materials used in the construction do not contain asbestos nor substances of very high concern as identified on 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. Electronic tools are used to describe the characteristics of the building as built, including the materials and components used, for the purpose of future maintenance, recovery, and reuse. The information is stored in a digital format and is made available to the client.
8. The building renovation complies with the applicable requirements for major renovations.[576] Alternatively, it leads to a reduction of primary energy demand (PED) of at least 30 %.[577]

Do no significant harm ('DNSH')

(1) Climate change mitigation	*DNSH as set out for this activity in Annex 2 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852*

[576] As set in the applicable national and regional building regulations for 'major renovation' implementing Directive 2010/31/EU. The energy performance of the building or the renovated part that is upgraded meets cost-optimal minimum energy performance requirements in accordance with the respective directive.

[577] The initial primary energy demand and the estimated improvement is based on a detailed building survey, an energy audit conducted by an accredited independent expert or any other transparent and proportionate method, and validated through an Energy Performance Certificate. The 30 % improvement results from an actual reduction in primary energy demand (where the reductions in net primary energy demand through renewable energy sources are not taken into account), and can be achieved through a succession of measures within a maximum of three years.

(2) Climate change adaptation	DNSH as set out in Appendix 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 as part of the renovation works, except for renovation works 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 Appendix 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 Appendix 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 Appendix 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	N/A

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[578]). No specific figures for renovations are available. However, an important share can be presumed as renovation works represents around 40% of investment in construction (FIEC Statistical Report). Given the need for a renovation wave, the material consumption for renovations can be expected to increase in the coming years.

[578] https://www.circularity-gap.world/2021#downloads

Construction of buildings **generates significant amounts of waste**. Overall, construction generates 35% of the EU's total waste.[579] No specific figures for renovations are available. However, 85-95% of the buildings that exist today are expected to be standing in 2050[580] and their renovation will generate large amounts of waste.

By nature of the activity, a renovation is circular as it retains parts of the building. Therefore, a **renovation is always less material intensive than construction of new buildings**.

A renovation is a **partial demolition**. Instead of being a source for the generation of waste, a qualitative and a quantitative approach to demolition can ensure that the building in question serves as **source for secondary materials**.

The criteria for substantial contribution address the whole life cycle, including quantitative targets to reduce the reliance on finite, virgin resources as inputs, and quantitative and qualitative targets to support the avoidance of waste during construction and at end of life.

The criteria represent a substantial contribution by:

- 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[581]. 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.
- Increasing the maintainability/recyclability/re-usability is promoted 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
- 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.

[579] Eurostat

[580] Renovation Wave Communication, p. 1

[581] https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=env_wastrt&lang=en

- Incentivising the use of widely recognised tools (LCA) to evaluate the lifecycle impacts and ensuring this data is available publicly to facililate improved benchmarking and target setting at asset, portfolio or even national and European level.[582]
- Improving resource efficiency at the design stage by applying circularity principles and by using recycled or re-used content. The 50% content is selected based on the ambition in the EU to at least double the circular material use rate by 2030 (CEAP, 2020). [583], and the EU call to "secure at least a doubling of resource productivity as compared with the pre-crisis trend; equivalent to an increase of well over 30% by 2030 " [584], Therefore, in order to comply with this EU circularity ambition, a 50% content is selected as making a substantial contribution. Together with the requirement to retain at least 50% of the existing asset, the criteria recognise that renovations contribute to circularity by the nature of the activity and incentivise maximised use of the existing asset.
- Circular material uses can be achieved for both finite and renewable / bio-based materials and the approaches for each may differ[585]. Recognising this and recognising that the waste hierarchy prioritises reuse over recycling, the criteria are designed to ensure that a combination of approaches (reuse, recycling and renewable materials is adopted rather than allowing only one of these strategies to meet the full 50% criterion.

  The distribution of the percentage is based on the principles to achieve lower environmental footprint materials in the building environment: (i) keeping construction products and materials in use and at their highest value , (ii) maximising recycled content, so that the use of primary resources can be minimised, and (iii) regenerating natural systems by promoting use of renewable materials that can be returned to the natural environment (such as biodegradable products).[586] Such principles are also supported by the EU Circular Economy Action Plan, which states that "Biological resources are a key input to the economy of the EU and will play an even more important

[582] OneClickLCA (2020) Embodied carbon benchmarks for European buildings, https://www.oneclicklca.com/eu-embodied-carbon-benchmarks

[583] The current (2016) rate for non-metallic minerals stands at around 15%: page 216 in https://www.eea.europa.eu/publications/soer-2020

[584] Towards a circular economy: A zero waste programme for Europe

[585] Eg. See Ellen MacArthur Foundation 'Butterfly Diagram' which shows how a circular economy can include both technical loops for finite materials and natural loops for renewable materials.

[586] https://ellenmacarthurfoundation.org/topics/circular-economy-introduction/overview

role in the future. The Commission will aim at ensuring the sustainability of renewable bio-based materials, including through actions following the Bioeconomy Strategy and Action Plan". [587]

The importance of both secondary materials and responsibly sourced renewable materials, as key factors to achieve circularity within the EU economy has been recognized by numerous sources. For instance, the Circularity Gap Report (2021) recognises the need to focus on secondary materials flows and also how utilisation of 'natural or renewable building materials […] help regenerate flows.' [588], while the State of Play for Circular Built Environment in Europe (2020), together with other studies, shows how building projects with responsibly sourced renewable materials are key within the circular economy principles as they have small carbon footprints and big carbon handprints. [589] [590] [591] [592] [593] [594] The contribution of renewable materials to circularity are recognised in numerous European Commission policies.[595] [596] [597]

- Preventing the wasting of energy during the lifetime of the asset by ensuring that minimum performance improvement in the primary energy demand of 30%[598] is achieved. Energy efficiency (alongside resource efficiency) is widely recognised as a key principle of a circular economy.[599] [600]

[587] https://ec.europa.eu/environment/pdf/circular-economy/new_circular_economy_action_plan.pdf

[588] Circularity Gap Report 2021: https://www.circularity-gap.world/2021

[589] State of Play for Circular Built Environment in Europe (2020)

[590] Switching the load-bearing structure from the conventionally used concrete to massive timber can lower a building's emissions by 34–84% (Skullestad et al. 2016): High-rise Timber Buildings as a Climate Change Mitigation Measure: A Comparative LCA of Structural System Alternatives

[591] https://www.pik-potsdam.de/en/news/latest-news/buildings-can-become-a-global-co2-sink-if-made-out-of-wood-instead-of-cement-and-steel

[592] https://mediatum.ub.tum.de/doc/1175337/file.pdf

[593] https://efi.int/sites/default/files/files/publication-bank/2018/efi_hurmekoski_wood_construction_2017_0.pdf

[594] 2020 Global Status Report for Buildings and Construction: https://globalabc.org/sites/default/files/inline-files/2020%20Buildings%20GSR_FULL%20REPORT.pdf

[595] https://ec.europa.eu/environment/strategy/forest-strategy_en

[596] https://ec.europa.eu/environment/strategy/forest-strategy_en

[597] https://ec.europa.eu/clima/eu-action/forests-and-agriculture/sustainable-carbon-cycles_en

[598] https://ec.europa.eu/finance/docs/level-2-measures/taxonomy-regulation-delegated-act-2021-2800-annex-1_en.pdf

[599] Circularity Gap Report 2021: https://www.circularity-gap.world/2021

[600] https://www.sciencedirect.com/science/article/abs/pii/S0921800916300325

6. Disaster risk management

6.1 Emergency services – Emergency health services

Description of the activity

Emergency first aid and medical care of patients (patients in the field, patients in temporary field hospitals and medical facility in-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
- 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.

The activity includes the setting up field hospitals and providing initial and/or followup trauma and medical care in those hospitals, taking into account acknowledged international guidelines for foreign field hospital use (where applicable), 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, mobile assets 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 of 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”

Activities and assets whose primary purpose is other than provision of civilian emergency services, can only be included when they are providing support to civilian emergency response to disasters which can be attributed to current and future projected climatic factors.

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[601] 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

[601] 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

scenarios[602] 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[603], scientific peer-reviewed publications and open source[604] 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[605] or rely on blue or green infrastructure[606] 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.

[602] Future scenarios include Intergovernmental Panel on Climate Change representative concentration pathways RCP2.6, RCP4.5, RCP6.0 and RCP8.5.

[603] 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/.

[604] Such as Copernicus services managed by the European Commission.

[605] 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/).

[606] 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).

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 including for climate change mitigation impacts in these categories: i. Scope 1 greenhouse gas (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 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))[607] related to Article 13(1) of the Industrial Emissions Directive (IED, Directive 2010/75/EU) – 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

[607] https://eippcb.jrc.ec.europa.eu/reference/

	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))[608] related to Article 13(1) of the Industrial Emissions Directive (IED, Directive 2010/75/EU) – 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;

[608] https://eippcb.jrc.ec.europa.eu/reference/

	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 the 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, including the negative impacts of high use of single-use non-recyclable products and improper waste management (both hazardous and non-hazardous); 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, aligned with the EU Waste Framework Directive (Directive 2008/98/EC) and the EU Action Plan on Circular Economy[609] including (but not limited to) measures for minimising the destruction of unused stockpiled goods. The plan is to explain the level of improvement achievable with the implementation of the proposed measures and include a time

[609] See Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Closing the loop - An EU action plan for the Circular Economy (COM/2015/0614 final) (https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52015DC0614)

	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))[610] related to Article 13(1) of the Industrial Emissions Directive (IED, Directive 2010/75/EU) – 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 the pollution

[610] https://eippcb.jrc.ec.europa.eu/reference/

	prevention and control objective including impacts in these categories: i. polluting emissions to air, water or land as defined in Article 3(3) of the Industrial Emissions Directive (IED, 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))[611] related to Article 13(1) of the Industrial Emissions Directive (IED, Directive 2010/75/EU) – 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;

[611] https://eippcb.jrc.ec.europa.eu/reference/

	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[612]) 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, Article 13(4), 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

[612] see European Environment Agency, Natura 2000 Network Viewer (https://natura2000.eea.europa.eu/)

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Rationale

On scope

- The highest Substantial Contribution (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

[613] https://eippcb.jrc.ec.europa.eu/reference/

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."[614]

- 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 Capital Expenditures (CapEx) and Operational Expenditures (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 are considered activities that enable Emergency

[614] See Decision No 1313/2013/EU of the European Parliament and of the Council of 17 December 2013 on a Union Civil Protection Mechanism (Text with EEA relevance) (https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02013D1313-20210101)

Services), e.g., the Information and Communications Technologies (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.

- The activity description precedes 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 the Technical Expert Group (TEG) recommendations and in the 1st

Delegated Act follow a 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.

- The above consideration of commensurate consideration of the primary purpose of the emergency service applies to when the activity is carried out outside of European Union, including in areas with lower environmental protection standards and available infrastructure. The operator is expected to act on best effort basis and to apply the principles of the referenced EU legislation to ensure "do no significant harm" to environmental objectives as well as transparently report on the impacts identified, measures planned and improvement level achievable with the planned actions.

- 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.

6.2 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, mobile assets 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.

Activities and assets whose primary purpose is other than provision of civilian emergency services, can only be included when they are providing support to civilian emergency response to disasters which can be attributed to current and future projected climatic factors.

No NACE codes directly associated with this activity

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[615] 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[616] consistent with the expected lifetime of the activity, including, at least, 10 to 30 years climate projections scenarios for major investments.

[615] 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

[616] 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[617], scientific peer-reviewed publications and open source[618] 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[619] or rely on blue or green infrastructure[620] 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:

[617] 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/.

[618] Such as Copernicus services managed by the European Commission.

[619] 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/).

[620] 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).

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 greenhouse gas (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); 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))[621] related to Article 13(1) of the Industrial Emissions Directive (IED, Directive 2010/75/EU) – 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.
(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);

[621] https://eippcb.jrc.ec.europa.eu/reference/

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))[622] related to Article 13(1) of the Industrial Emissions Directive (IED, Directive 2010/75/EU) – 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.

[622] https://eippcb.jrc.ec.europa.eu/reference/

(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 the 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, including the negative impacts of frequent use of single-use, non-recyclable 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 and aligned with the EU Waste Framework Directive (Directive 2008/98/EC) and the EU Action Plan on Circular Economy[623] including (but not limited to) measures for minimising the destruction of unused stockpiled goods. 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;

[623] See Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Closing the loop - An EU action plan for the Circular Economy (COM/2015/0614 final) (https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52015DC0614)

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(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:

[624] https://eippcb.jrc.ec.europa.eu/reference/

i) polluting emissions to air, water or land as defined in Article 3(3) of the Industrial Emissions Directive (IED, 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;

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[626] see European Environment Agency, Natura 2000 Network Viewer (https://natura2000.eea.europa.eu/)

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Rationale

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[627] https://eippcb.jrc.ec.europa.eu/reference/

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."[628]

- 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 Capital Expenditures (CapEx) and Operational Expenditures (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 are considered activities that enable Emergency

[628] See Decision No 1313/2013/EU of the European Parliament and of the Council of 17 December 2013 on a Union Civil Protection Mechanism (Text with EEA relevance) (https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02013D1313-20210101)

Services), e.g., the Information and Communications Technologies (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.

- 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 precedes 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 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 the Technical Expert Group (TEG) recommendations and in the 1st Delegated Act follow a 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.

- The above consideration of commensurate consideration of the primary purpose of the emergency service applies to when the activity is carried out outside of European Union, including in areas with lower environmental protection standards and available infrastructure. The operator is expected to act on best effort basis and to apply the principles of the referenced EU legislation to ensure “do no significant harm” to

environmental objectives as well as transparently report on the impacts identified, measures planned and improvement level achievable with the planned actions.

- 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.

6.3 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, mobile assets 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.

Activities and assets whose primary purpose is other than provision of civilian emergency services, can only be included when they are providing support to civilian emergency response to disasters which can 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

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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[629] 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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[629] 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[630] 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[631], scientific peer-reviewed publications and open source[632] 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[633] or rely on blue or green infrastructure[634] 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.

[630] Future scenarios include Intergovernmental Panel on Climate Change representative concentration pathways RCP2.6, RCP4.5, RCP6.0 and RCP8.5.

[631] 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/.

[632] Such as Copernicus services managed by the European Commission.

[633] 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/).

[634] 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).

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) ontributing 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 objective including impacts in these categories: i) Scope 1 greenhouse gas (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))[635] related to Article 13(1) of the Industrial Emissions Directive (IED, Directive 2010/75/EU) – 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

[635] https://eippcb.jrc.ec.europa.eu/reference/

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 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))[636] related to Article 13(1) of the Industrial Emissions Directive (IED, Directive 2010/75/EU) – 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;

[636] https://eippcb.jrc.ec.europa.eu/reference/

	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 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, non-recyclable 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, aligned with the EU Waste Framework Directive (Directive 2008/98/EC) and the EU Action Plan on Circular Economy[637] including (but not limited to) planned actions for improved waste management, reduction of waste volume and positive contribution to circular economy and measures for

[637]See Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Closing the loop - An EU action plan for the Circular Economy (COM/2015/0614 final) (https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52015DC0614)

	minimising the destruction of unused stockpiled goods. 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))[638] related to Article 13(1) of the Industrial Emissions Directive (IED, Directive 2010/75/EU) – 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:

[638] https://eippcb.jrc.ec.europa.eu/reference/

a) Identification of key harmful climate and environmental impacts of their assets and operations, as a minimum for the pollution prevention and control objective including impacts in these categories:

i) polluting emissions to air, water or land as defined in Article 3(3) of the Industrial Emissions Directive (IED, 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))[639] related to Article 13(1) of the Industrial Emissions Directive (IED, Directive 2010/75/EU) – 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;

[639] https://eippcb.jrc.ec.europa.eu/reference/

	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[640]) 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, Article 13(4), 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; ii) impacts on land take and on the application on “land take hierarchy” as described in the EU Soil Strategy for 2030[641], including arising due to the establishment and medium- to long-term operation of disaster relief camps.

[640] see European Environment Agency, Natura 2000 Network Viewer (https://natura2000.eea.europa.eu/)

[641] See Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: EU Soil Strategy for 2030 Reaping the benefits of healthy soils for people, food, nature and climate (COM/2021/699 final) (https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021DC0699)

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))[642] related to Article 13(1) of the Industrial Emissions Directive (IED, Directive 2010/75/EU) – 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.

[642] https://eippcb.jrc.ec.europa.eu/reference/

Rationale

On scope

- The highest Substantial Contribution (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."[643]
- 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 Capital Expenditures (CapEx) and Operational Expenditures (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

[643] See Decision No 1313/2013/EU of the European Parliament and of the Council of 17 December 2013 on a Union Civil Protection Mechanism (Text with EEA relevance) (https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02013D1313-20210101)

(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 are considered activities that enable Emergency Services), e.g., the Information and Communications Technologies (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.
- 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.
- The activity description precedes 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 the Technical Expert Group (TEG) recommendations and in the 1st Delegated Act follow a 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.
- The above consideration of commensurate consideration of the primary purpose of the emergency service applies to when the activity is carried out outside of European Union, including in areas with lower environmental protection standards and available infrastructure. The operator is expected to act on best effort basis and to apply the principles of the referenced EU legislation to ensure “do no significant harm” to environmental objectives as well as transparently report on the impacts identified, measures planned and improvement level achievable with the planned actions.

- 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.

6.4 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 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, mobile assets 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.

Activities and assets whose primary purpose is other than provision of civilian emergency services, can only be included when they are providing support to civilian emergency response to disasters which can 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"

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[644] 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:

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[644] 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[645] 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[646], scientific peer-reviewed publications and open source[647] 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[648] or rely on blue or green infrastructure[649] 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;

[645] Future scenarios include Intergovernmental Panel on Climate Change representative concentration pathways RCP2.6, RCP4.5, RCP6.0 and RCP8.5.

[646] 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/

[647] Such as Copernicus services managed by the European Commission.

[648] 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/).

[649] 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	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 greenhouse gas (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))[650] related to Article 13(1) of the Industrial Emissions Directive (IED, Directive 2010/75/EU) – 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

[650] https://eippcb.jrc.ec.europa.eu/reference/

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))[651] related to Article 13(1) of the Industrial Emissions Directive (IED, Directive 2010/75/EU) – 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;

[651] https://eippcb.jrc.ec.europa.eu/reference/

	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 the 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 and aligned with the EU Waste Framework Directive (Directive 2008/98/EC) and the EU Action Plan on Circular Economy[652] including (but not limited to) measures for minimising the destruction of unused stockpiled goods. The plan is to explain the level of improvement achievable with the implementation of the proposed measures

[652] See Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Closing the loop - An EU action plan for the Circular Economy (COM/2015/0614 final) (https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52015DC0614)

	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))[653] related to Article 13(1) of the Industrial Emissions Directive (IED, Directive 2010/75/EU) – 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

[653] https://eippcb.jrc.ec.europa.eu/reference/

prevention and control objective including impacts in these categories:

i) polluting emissions to air, water or land as defined in Article 3(3) of the Industrial Emissions Directive (IED, 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))[654] related to Article 13(1) of the Industrial Emissions Directive (IED, Directive 2010/75/EU) – 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;

[654] https://eippcb.jrc.ec.europa.eu/reference/

	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[655]) 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, Article 13(4), 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;

[655] see European Environment Agency, Natura 2000 Network Viewer (https://natura2000.eea.europa.eu/)

	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))[656] related to Article 13(1) of the Industrial Emissions Directive (IED, Directive 2010/75/EU) – 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 Substantial Contribution (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

[656] https://eippcb.jrc.ec.europa.eu/reference/

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."[657]

- 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 Capital Expenditures (CapEx) and Operational Expenditures (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 are considered activities that enable Emergency Services), e.g., the Information and

[657] See Decision No 1313/2013/EU of the European Parliament and of the Council of 17 December 2013 on a Union Civil Protection Mechanism (Text with EEA relevance) (https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02013D1313-20210101)

Communications Technologies (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.

- The activity description precedes 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 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 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 the Technical Expert Group (TEG) recommendations and in the 1st

Delegated Act follow a 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.

- The above consideration of commensurate consideration of the primary purpose of the emergency service applies to when the activity is carried out outside of European Union, including in areas with lower environmental protection standards and available infrastructure. The operator is expected to act on best effort basis and to apply the principles of the referenced EU legislation to ensure "do no significant harm" to environmental objectives as well as transparently report on the impacts identified, measures planned and improvement level achievable with the planned actions.

- 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.

6.5 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 Directive (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 Directive (2004/35/CE).

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, mobile assets 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.

Activities and assets whose primary purpose is other than provision of civilian emergency services, can only be included when they are providing support to civilian emergency response to disasters which can 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.

Activity “Hazardous Materials Response” includes activities that pertain to NACE code 39.00, and also comply with the Environmental Liability Directive (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[658] 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

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scenarios[659] 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[660], scientific peer-reviewed publications and open source[661] 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[662] or rely on blue or green infrastructure[663] 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,

[659] Future scenarios include Intergovernmental Panel on Climate Change representative concentration pathways RCP2.6, RCP4.5, RCP6.0 and RCP8.5.

[660] 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/

[661] Such as Copernicus services managed by the European Commission.

[662] 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/).

[663] 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 greenhouse gas (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); 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))[664] related to Article 13(1) of the Industrial Emissions Directive (IED, Directive 2010/75/EU) – 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);

[664] https://eippcb.jrc.ec.europa.eu/reference/

	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))[665] related to Article 13(1) of the Industrial Emissions Directive (IED, Directive 2010/75/EU) – 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.

[665] https://eippcb.jrc.ec.europa.eu/reference/

(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 the 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 (both hazardous and non-hazardous); 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, aligned with the EU Waste Framework Directive (Directive 2008/98/EC) and the EU Action Plan on Circular Economy[666] including (but not limited to) measures for safe handling and disposal of hazardous waste and for minimising the destruction of unused stockpiled goods. 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

[666] See Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Closing the loop - An EU action plan for the Circular Economy (COM/2015/0614 final) (https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52015DC0614)

	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))[667] related to Article 13(1) of the Industrial Emissions Directive (IED, Directive 2010/75/EU) – 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 the pollution prevention and control objective including impacts in these categories: i) polluting emissions to air, water or land as defined in Article 3(3) of the Industrial Emissions Directive (IED, Directive 2010/75/EU);

[667] https://eippcb.jrc.ec.europa.eu/reference/

	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))[668] related to Article 13(1) of the Industrial Emissions Directive (IED, Directive 2010/75/EU) – 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:

[668] https://eippcb.jrc.ec.europa.eu/reference/

	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[669]) 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, Article 13(4), 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:

[669] see European Environment Agency, Natura 2000 Network Viewer (https://natura2000.eea.europa.eu/)

	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))[670] related to Article 13(1) of the Industrial Emissions Directive (IED, Directive 2010/75/EU) – 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 Substantial Contribution (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."[671]

[670] https://eippcb.jrc.ec.europa.eu/reference/

[671] See Decision No 1313/2013/EU of the European Parliament and of the Council of 17 December 2013 on a Union Civil Protection Mechanism (Text with EEA relevance) (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 Capital Expenditures (CapEx) and Operational Expenditures (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 are considered activities that enable Emergency Services), e.g., the Information and Communications Technologies (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.
- The activity description precedes 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) 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 the Technical Expert Group (TEG) recommendations and in the 1st Delegated Act follow a 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.

- The above consideration of commensurate consideration of the primary purpose of the emergency service applies to when the activity is carried out outside of European Union, including in areas with lower environmental protection standards and available infrastructure. The operator is expected to act on best effort basis and to apply the principles of the referenced EU legislation to ensure “do no significant harm” to environmental objectives as well as transparently report on the impacts identified, measures planned and improvement level achievable with the planned actions.

- 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

6.6 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, mobile assets 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.

Activities and assets whose primary purpose is other than provision of civilian emergency services, can only be included when they are providing support to civilian emergency response to disasters which can 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[672] 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[673] 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

[672] 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

[673] 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[674], scientific peer-reviewed publications and open source[675] 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[676] or rely on blue or green infrastructure[677] 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:

[674] 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.

[675] Such as Copernicus services managed by the European Commission.

[676] 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/).

[677] 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).

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 greenhouse gas (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); iii) emissions of fluorinated greenhouse gases: 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))[678] related to Article 13(1) of the Industrial Emissions Directive (IED, Directive 2010/75/EU) – 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) Comply with Article 11 of Regulation 517/2014: on fluorinated greenhouse gases d) Are developed in consultation with relevant stakeholders, including but not limited to environmental protection authorities; e) 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

[678] https://eippcb.jrc.ec.europa.eu/reference/

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), 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 (but not limited to) planned actions to counteract impacts of harmful substance on water resources by, phasing out 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))[679] related to Article 13(1) of the Industrial Emissions Directive (IED, Directive 2010/75/EU) – 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 the 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. Including (but not limited to) measures for safe storage and disposal of chemical agents,

[679] https://eippcb.jrc.ec.europa.eu/reference/

	such as those in firefighting foams, extinguishing agents and fire retardants aligned with the EU Waste Framework Directive (Directive 2008/98/EC) and the EU Action Plan on Circular Economy[680]. 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))[681] related to Article 13(1) of the Industrial Emissions Directive (IED, Directive 2010/75/EU) – 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

[680] See Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Closing the loop - An EU action plan for the Circular Economy (COM/2015/0614 final) (https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52015DC0614)

[681] https://eippcb.jrc.ec.europa.eu/reference/

	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 the pollution prevention and control objective including impacts in these categories: i) polluting emissions to air, water or land as defined in Article 3(3) of the Industrial Emissions Directive (IED, Directive 2010/75/EU), including the negative impacts of harmful substances in firefighting foams/fire extinguishing agents/fire retardants on, environmental pollution levels and the negative impacts of the use of halons on the depletion of ozone layer. 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))[682] related to Article 13(1) of the Industrial Emissions Directive (IED, Directive 2010/75/EU) – 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) Comply with Article 13 of Regulation 1005/2009 as regards critical uses of halons and decommissioning of equipment containing halons; d) Are developed in consultation with relevant stakeholders, including but not limited to environmental protection authorities; e) 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[683]) in accordance with the Habitats Directive (Article 3, Directive 92/43/EEC), Birds Directive (Article 4, Directive 2009/147/EC), and the Marine Strategy

[682] https://eippcb.jrc.ec.europa.eu/reference/

[683] see European Environment Agency, Natura 2000 Network Viewer (https://natura2000.eea.europa.eu/)

Framework Directive (Recital 6, Article 13(4), 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.

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))[684] related to Article 13(1) of the Industrial Emissions Directive (IED, Directive 2010/75/EU) – 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;

[684] https://eippcb.jrc.ec.europa.eu/reference/

	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 Substantial Contribution (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."[685]
- 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. 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)

[685] See Decision No 1313/2013/EU of the European Parliament and of the Council of 17 December 2013 on a Union Civil Protection Mechanism (Text with EEA relevance) (https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02013D1313-20210101)

(prevention), these actions are accounted for in the scope of this activity, meaning that the Capital Expenditures (CapEx) and Operational Expenditures (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 are considered activities that enable Emergency Services), e.g., the Information and Communications Technologies (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
- The activity description precedes 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

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 the Technical Expert Group (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.

- The above consideration of commensurate consideration of the primary purpose of the emergency service applies to when the activity is carried out outside of European Union, including in areas with lower environmental protection standards and available infrastructure. The operator is expected to act on best effort basis and to apply the principles of the referenced EU legislation to ensure “do no significant harm” to environmental objectives as well as transparently report on the impacts identified, measures planned and improvement level achievable with the planned actions.

- 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.

6.7 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, excluding activities described in the criteria for "Flood risk prevention and protection infrastructure for inland river, coastal and urban floods"
- 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 to ensure communications during and after emergencies
- Setting up, maintenance and operation of emergency power generation systems during and after emergencies

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, mobile assets 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.

Activities and assets whose primary purpose is other than provision of civilian emergency services, can only be included when they are providing support to civilian emergency response to disasters which can 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[686] 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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[686] 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[687] 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[688], scientific peer-reviewed publications and open source[689] 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[690] or rely on blue or green infrastructure[691] 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;

[687] Future scenarios include Intergovernmental Panel on Climate Change representative concentration pathways RCP2.6, RCP4.5, RCP6.0 and RCP8.5.

[688] 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/.

[689] Such as Copernicus services managed by the European Commission.

[690] 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/).

[691] 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;
a) 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 greenhouse gas (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))[692] related to Article 13(1) of the Industrial Emissions Directive (IED, Directive 2010/75/EU) – 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	1.The operator of this activity has developed and implemented Climate Change Mitigation and Environmental Protection Plan following these steps:

[692] https://eippcb.jrc.ec.europa.eu/reference/

water and marine resources	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))[693] related to Article 13(1) of the Industrial Emissions Directive (IED, Directive 2010/75/EU) – or other techniques that demonstrably provide for an equivalent or higher

[693] https://eippcb.jrc.ec.europa.eu/reference/

	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 the 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 and aligned with the EU Waste Framework Directive (Directive 2008/98/EC) and the EU

	Action Plan on Circular Economy[694], good industry practice for removal of temporary infrastructure, as defined, in the EU Construction and Demolition Waste Protocol[695] , including (but not limited to) measures for minimising the destruction of unused stockpiled goods. 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))[696] related to Article 13(1) of the Industrial Emissions Directive (IED, Directive 2010/75/EU) – 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;

[694] See Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Closing the loop - An EU action plan for the Circular Economy (COM/2015/0614 final) (https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52015DC0614)

[695] EU Construction and Demolition Waste Protocol and Guidelines | Internal Market, Industry, Entrepreneurship and SMEs (europa.eu)

[696] https://eippcb.jrc.ec.europa.eu/reference/

	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 the pollution prevention and control objective including impacts in these categories: i) polluting emissions to air, water or land as defined in Article 3(3) of the Industrial Emissions Directive (IED, 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))[697] related to Article 13(1) of the Industrial Emissions Directive (IED, Directive 2010/75/EU) – 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[698]) 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, Article 13(4), 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

[697] https://eippcb.jrc.ec.europa.eu/reference/

[698] see European Environment Agency, Natura 2000 Network Viewer (https://natura2000.eea.europa.eu/)

	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))[699] related to Article 13(1) of the Industrial Emissions Directive (IED, Directive 2010/75/EU) – 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	

[699] https://eippcb.jrc.ec.europa.eu/reference/

On scope

- The highest Substantial Contribution (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."[700]
- 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 Capital Expenditures (CapEx) and Operational Expenditures (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

[700] See Decision No 1313/2013/EU of the European Parliament and of the Council of 17 December 2013 on a Union Civil Protection Mechanism (Text with EEA relevance) (https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02013D1313-20210101)

cannot be defined as one of the Emergency Services (these are considered activities that enable Emergency Services), e.g., the Information and Communications Technologies (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.

- The activity description precedes 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 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 the Technical Expert Group (TEG) recommendations and in the 1st

Delegated Act follow a 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.
- The above consideration of commensurate consideration of the primary purpose of the emergency service applies to when the activity is carried out outside of European Union, including in areas with lower environmental protection standards and available infrastructure. The operator is expected to act on best effort basis and to apply the principles of the referenced EU legislation to ensure “do no significant harm” to environmental objectives as well as transparently report on the impacts identified, measures planned and improvement level achievable with the planned actions.
- 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

6.8 Flood risk prevention and protection infrastructure for inland river, coastal and urban 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, floods from the seas in the coastal areas and pluvial floods in the context of the floods directive. Urban pluvial flooding is caused by either intense or prolonged rainfall events, which generate high runoff volumes that exceed the capacity of drainage systems or also by the flow caused by sewers and urban minor watercourses, whose capacity has been exceeded as a result of extreme event. Measures undertaken are inter alia (not an exhaustive list):

Structural for flood protection: Dykes, river embankments; Sea defence dykes, storm-surge barriers, seawalls, groynes and breakwaters; Water retention (off-line) reservoirs for flood control purposes; Urban drainage systems and Sustainable Urban Drainage Systems (SUDs); 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:

- Nature based Solutions for flood protection as the activity is covered by a separate template under the NACE code F42.91 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.
- Infrastructure for water transport such as waterways, harbours and pleasure ports (marinas) given that these activities were already covered with a separate template under the 6.16 activity of Annex 2 in the first Delegated Act as transport focused

activities. The activities could be associated with several NACE codes, in particular F42.91, F71.1 or F71.20 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

- Emergency response and recovery plans in case of a flood event as this activity falls under the disaster management area and it is covered with separate templates under the “Emergency Services” subject title. The activities could be associated with several NACE codes, in particular 84.25, 02.40, 80.20, 52.23, 86.10, 86.90, 39.00, 88.99 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

- 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.

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[701] 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[702], scientific peer-reviewed publications and open source[703] 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[704] or rely on blue or green infrastructure[705] 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;

[701] Future scenarios include Intergovernmental Panel on Climate Change representative concentration pathways RCP2.6, RCP4.5, RCP6.0 and RCP8.5.

[702] 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/.

[703] Such as Copernicus services managed by the European Commission.

[704] 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/) .

[705] 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 Appendix B of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852. Where relevant, the provisions of Article 4 of Directive 2000/60/EC and in particular paragraph 7 of that Article, prior to construction, will apply to assess all the project's potential impacts on the status of water bodies within the same river basin. 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.[706]
(5) Pollution prevention and control	Appropriate measures are implemented to avoid and mitigate harmful stormwater overflows from the combined wastewater collection system, which may include Sustainable Urban Drainage Systems (SUDs), separate stormwater collection systems, retention tanks and treatment of the first flush.
(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 the Habitats Directive[707] 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 accordance with the Floods Directive, where relevant.

[706] EU Construction and Demolition Waste Protocol and Guidelines | Internal Market, Industry, Entrepreneurship and SMEs (europa.eu)

[707] For avoidance of doubt, all habitat types listed in Annex I and all species listed in Annex II (Habitats Directive, Art. 1, 2, 3), any activity that would lead to a deterioration of the conservation status is excluded (Art. 6 (2)). For species listed in Annex IV(a) and under strict protection (Art.12), activities that are detrimental to the maintenance of the population of the species concerned at a favourable status in their natural range are excluded.

	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

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[708].

Heavy rainfall is increasing in frequency and severity due to climate change. Cities are particularly susceptible to flooding from downpours because of their large share of impervious surfaces. Minimising pluvial flood risk requires all involved stakeholders to collaborate and overcome various barriers. However, citizen awareness and engagement in policy making is rather low. Accordingly, citizens' willingness to pay for flood adaptation is limited. Stimulating flood risk awareness by combining financial incentives with more advanced arrangements for active citizen engagement is key for the cities to tackle pluvial flooding[709]. 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

[708] 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

[709] Romy C. Brockhoff, Steven H. A. Koop,and Karin A. W. Snel (2019). Pluvial Flooding in Utrecht: On Its Way to a Flood-Proof City

by two to three orders of magnitude by the end of the century, ranging between 93 and €961 billion.[710]

The European Commission launched a new EU strategy on adaptation to climate change in early 2021[711]. 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[712].

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. According to the Floods Directive, flood types considered are fluvial, pluvial and coastal ones including flooding linked to combined and surface water drainage systems. 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 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.

[710] 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.

[711] 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

[712] Technical Screening Criteria and DNSH for the activity of NbS for flood protection for the Water Objective have been developed under a separate template

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[713]. 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)[714] 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 in 2018 of MSs' FRMPs[715] 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

[713] 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

[714] 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

[715] 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

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[716] and climate modelling tools such as those available through the Copernicus Climate Change Service[717] 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 engineering solutions to changing climate conditions based on a continuous iterative process of review and learning new information.

Rationale for Do No Significant Harm criteria:

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. Quantitative thresholds such recovery targets for CDW are not introduced here since the common types of construction material for large scale flood protection schemes such as gravel and sand, are naturally occurring material which is 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. Flood protection activity is by nature not a polluting activity. Nevertheless, specific mitigation measures are recommended to prevent pollution of the receiving waters, in particular in the case of storm water overflows as a result of intense rainfall over a relatively small urban area. Depending on the origin of the receiving waters and therefore the different pollutant load (e.g., of rainwater, rainwater run-off from roofs, rainwater run-off from motorways), SUDs treat these waters before discharging/infiltrating the storm 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.

In addition, any possible harmful effects of pollution due to urban flooding are mitigated by the measures included under the DNSH for the environmental 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 directly linked to use and presence of chemicals and as such are not considered as relevant to the activity.

DNSH Biodiversity and ecosystem services: EIA Directive is not sufficient enough 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

6.9 Nature based solutions (Nbs) for flood and drought 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, as well as contributing to preventing droughts, thus enhancing the good status of both surface and ground water bodiesand producing co-benefits to ecosystems and biodiversity. Given the mutual benefits of NbS to floods and droughts, this activity refers also to measures aiming at drought prevention.

NbS to reduce flood and drought 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. They are 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 so as to restore the retention capacity of the floodplain and its ecosystem's function

- Riparian/floodplain vegetation development

- Re-meandering river course consists in creating a new meandering course or reconnecting cut-off meanders, therefore slowing down the river flow. The new form of the river channel creates new flow conditions and very often also has a positive impact on sedimentation and biodiversity. The newly created or reconnected meanders also provide habitats for a wide range of aquatic and land species of plants and animals.

- 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 material re-naturalization by recovering the nature-like structure and composition of the bed load, in particular the equilibrium between coarse and fine sediment. Also, by removing bed fixatio N/Armoring, and improveming/developing of key habitats cover
- Wetlands restoration which provides water retention, biodiversity enhancement or water quality improvement. Wetland restoration can involve technical, spatially large-scale measures (including the installation of ditches for rewetting or the cutback of dykes to enable flooding); technical small-scale measures such as clearing trees; changes in land-use and agricultural measures, such as adapting cultivation practices in wetland areas. They can improve the hydrological regime of degraded wetlands and generally enhance habitat quality. 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

River basin management measures (not an exhaustive list):

- Land management measures such as afforestation of reservoir catchments and Upper watershed source control
- Restoration of natural infiltration to groundwater by facilitating/augmenting soil retention capacity and infiltration
- Managed Aquifer Recharge (MAR) via subsurface direct recharge - infiltration and recharge of the groundwater aquifer is accomplished through wells reaching the saturated zone
- Detention Basins and retention ponds

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 considered as small-scale NbS and are excluded here as they are covered under NACE code E37- Sewerage.

Substantial contribution to sustainable use and protection for water and marine resources

The activity is eligible to substantially contribute only if it complies with the following three criteria:

1. The activity is a quantifiable and 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. In relation to drought risk reduction, the activity is a quantifiable and time bound measure to achieve the WFD objectives in accordance with a RBMP including a Drought management plan, where relevant. For countries outside the EU the activity is identified as a flood risk reduction or a drought 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 and drought 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[718] 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[719] expected by the end of 2021). Each Member State develops ecosystem action plan with clear and binding targets over a clearly defined timeframe and definition of criteria either on restoration or conservation which

[718] 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’.

[719] Protecting biodiversity: nature restoration targets under EU biodiversity strategy (europa.eu) Inception impact assessment of restoration regulation proposal

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[720]. For countries outside EU, National Biodiversity Strategies and Action Plans[721] 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 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 (including Drought management plans, where relevant) 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 Appendix A of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.
(4) Transition to a circular economy	N/A

[720] IUCN Global Standard for NbS | IUCN

[721] National Biodiversity Strategies and Action Plans (NBSAPs) (cbd.int)

(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 biodiversity and ecosystems	The activity: 1. Complies with the requirements under the SEA and the EIA Directives 2. Complies with the Habitats Directive[722] 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.

[722] For avoidance of doubt, all habitat types listed in Annex I and all species listed in Annex II (Habitats Directive, Art. 1, 2, 3), any activity that would lead to a deterioration of the conservation status is excluded (Art. 6 (2)). For species listed in Annex IV(a) and under strict protection (Art.12), activities that are detrimental to the maintenance of the population of the species concerned at a favourable status in their natural range are excluded.

	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 ecological status and/or favourable 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'.[723]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, retaining water to address droughts and water scarcity, 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".[724] 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

[723] https://ec.europa.eu/info/research-and-innovation/research-area/environment/nature-based-solutions_en/

[724] https://www.eea.europa.eu/publications/flood-risks-and-environmental-vulnerability

floodplains and why natural condition of flood plains are an important ecological part of a river system.[725]

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”[726]. 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).

Droughts and water scarcity are no longer rare or extreme events in Europe, and about 20 % of the European territory and 30 % of Europeans are affected by water stress during an average year, the EEA report says. Climate change is expected to make the problem worse, as droughts are increasing in frequency, magnitude and impact. The trends are especially worrying for southern and south-western Europe where river discharge during summer could decline by up to 40 %, under a 3°C temperature rise scenario. In those areas, agriculture, public water supply and tourism put the main pressures on water availability with significant seasonal peak in summer.

In October 2021, the EEA published an updated assessment on ‘Water resources across Europe — confronting water stress[727]’, presenting the current state of water stress in Europe with the aim to put focus on managing water availability risks under the impacts of changing climate. The report concludes that until now, there have only been a few well-documented cases of NbS that have been specifically designed to address the issues of water stress. The 2020 overview of the state of the art in EU-funded projects does not change this conclusion, even if drought management can also benefit from several NbS (EC, 2020i): there is a wide

[725] EEA 2018: why should we care about floodplains?: Briefing No 14/2018

[726] Nature-based solutions in Europe: Policy, knowledge and practice for climate change adaptation and disaster risk reduction — European Environment Agency (europa.eu)

[727] EEA Report No 12/2021 - Water resources across Europe — confronting water stress: an updated assessment — European Environment Agency (europa.eu)

range of on-farm measures that increase the infiltration of rainfall into the soil and/or the storage of groundwater. Policies and regulations at European level are in place to address strengthening the resilience of its ecosystems and use water more efficiently to combat droughts and water scarcity but their implementation and effectiveness need to be improved. The RBMPs of the various EU Member States have not fully exploited the natural water retention measures.

The 2014 Common Implementation Strategy (CIS) policy paper on Natural Water Retention Measures (NWRM) underlined the important role that these multi-functional measures play in protecting and managing water resources by using natural means and processes. NWRM have the potential to provide multiple benefits, including flood risk reduction, drought mitigation, water quality improvement, groundwater recharge and habitat improvement. As such, they help achieving the goals of the WFD, the FD and the Habitats and Birds Directive. The NWRM platform gathers information on NWRM at EU level, providing further insight on the NWRM definition and individual NWRMs grouped by sectors and/or benefits.[728]

With regard to applying the ecosystem services concept to water stress problems, many initiatives are already evolving, and good progress is being made in Europe. Knowledge gaps to be bridged include connecting ecological status to drought or stress indicators and putting a value on the appreciation of environmental quality.

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[729]. 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

[728] Natural Water Retention Measures (nwrm.eu)

[729] 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.

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.

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[730] 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.[731] Furthermore, there is no requirement yet to comprehensively map, monitor, assess and achieve good status of

[730] https://eur-lex.europa.eu/resource.html?uri=cellar:a3c806a6-9ab3-11ea-9d2d-01aa75ed71a1.0001.02/DOC_1&format=PDF

[731] Protecting biodiversity: nature restoration targets under EU biodiversity strategy (europa.eu)

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.[732] 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.

- 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 (e.g., 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

[732] Nature-based solutions for flood mitigation and coastal resilience - Publications Office of the EU (europa.eu)

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.

7. Transport

7.1 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 dB less than the limit value LV as outlined in UNECE Regulation No. 117 for the corresponding period of its application.

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 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[733], where emissions from road transport in 2018 were ~23.05 % above 1990 levels[734] (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 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[735].

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

[733] TERM 002 Published 18 Dec 2020

[734] https://di.unfccc.int/time_series

[735] European Automobile Manufacturers' Association. Available online: https://www.acea.be/automobile-industry/buses

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[736]. 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 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[737].

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

[736] EU emission inventory report 1990-2018 under the UNECE Convention on Long-range Transboundary Air Pollution (LRTAP)

[737] CSI 004, AIR 003 Published 06 Oct 2020

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 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.

7.2 Manufacturing of aircraft

Description of the activity

C30.3 - Manufacturing of aircraft

Manufacture, repair, maintenance, overhaul, retrofitting, design, repurposing and upgrade of aircraft and aircraft parts and equipment.

Where an economic activity in this category does not fulfil the substantial contribution criterion specified in point 1. 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. Zero exhaust CO2 emission aircraft such as those powered by electricity or green hydrogen.

OR

2.A. Until end of 2027, commercial aircraft (excluding aircraft produced for business aviation, including for private or commercial use) 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 decommissioned / aircraft delivered] averaged over the last 10 years as evidenced by publically available and independently verified data (e.g., Cirium):

i. Aircraft of greater than 5.7t and less than or equal to 60t maximum take-off mass, certified to the ICAO CO_2 standard with a margin of at least minus 11% to the New Type limit
ii. Aircraft of greater than 60t and less than or equal to 150t maximum take-off mass, certified to the ICAO CO_2 standard with a margin of at least minus 2% to the New Type limit.
iii. Aircraft of greater than 150t maximum take-off mass, certified to the ICAO CO2 standard with a margin of at least minus 1.5% to the New Type limit.

2.B From 2028 to 2032, aircraft meeting the criteria [2] above and certified to run on 100% SAF.

2.C From 2033, aircraft meeting future criteria to be set at an upcoming review of the taxonomy.

In the absence of an ICAO CO_2 standard certification, a declaration can be delivered by the aircraft manufacturer that the aircraft meets the required level of performance and margins of improvement with the condition that the aircraft is certified [within three years of the entry into force of the criteria].

The margins defined in [2.A] 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 service providers as well as Maintenance, Repair and Overhaul (MRO) services providers to the extent that the activity

can be linked to an eligible aircraft type and improves or maintains the level of efficiency of the aircraft.

Do no significant harm ('DNSH')

(2) Climate change adaptation	DNSH as set out in Appendix A of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852, ensuring 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) Amendment 13 of Volume I (noise), Chapter 14, of Annex 16 to the Chicago Convention; (b) Amendment 10 of Volume II (engine emissions), Chapters 2 and 4, of Annex 16 to the Chicago Convention;

	(c) DNSH as set out in Appendix C of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852 (d) 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 of ensuring 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 CO_2 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 CO_2 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 CO_2 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 rule to ensure taxonomy criteria does not contribute to increasing aircraft fleets and therefore emissions.

- For aircraft manufacturers the requirement is that eligible aircraft are restricted to those replacing existing less efficient aircraft. This requirement will be verified by identifying the ratio of aircraft being decommissioned 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 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. The share of taxonomy compliance of aircraft manufacturers is only for the percentage of best in class efficient aircraft delivered that are replacing older aircraft globally.

- For leasing companies, a decommissioning (permanent removal from service) or selling rule requires that the company proves that an old, non-taxonomy compliant aircraft was permanently removed or left its fleet to make a new, more efficient one eligible. In order to avoid companies using the taxonomy to write off aircraft investments currently not flying but parked in long term storage facilities, this decommissioning rule requires the decommissioned aircraft have been in service at least 6 months before the date of decommissioning. Leasing of aircraft criteria should take into account previous efforts to improve the energy performance of fleets but also ensure that fleet expansion and overall growth in CO_2 emissions that has occurred before the entry into force of the criteria is not considered as taxonomy compliant. This is why for aircraft leased before the entry into force of the taxonomy, the taxonomy compliant revenue can be determined by the portion of the fleet that meets NACE C30.3 requirements multiplied

by the global average replacement ratio (total aircraft decommissioned over total aircraft delivered). The taxonomy compliance of the revenues generated by the acquisition of a new aircraft after the entry into force of the taxonomy, when an old one is sold, will be limited by a ratio of replacement, in order to ensure this sale would not expand the global fleet and therefore emissions. The ratio does not apply for capital expenditure. The capital expenditure for the acquisition of a new aircraft when an old one is decommissioned or sold is considered 100% taxonomy compliant (as a transition activity) in order to not limit financing for fleet replacement.

- For aircraft operators, the criteria aim at ensuring the newly acquired aircraft replaces an older non-taxonomy compliant aircraft, by proving that the latter has been sold or decommissioned. Air transport criteria should take into account previous efforts to improve the energy performance of fleets but also ensure that fleet expansion and overall growth in CO_2 emissions that has occurred before the entry into force of the criteria is not considered as taxonomy compliant. This is why for air transport operators, before the entry into force of the taxonomy, taxonomy compliant revenues can be determined by the portion of the fleet that meets NACE C30.3 requirements multiplied by the global average replacement ratio (total aircraft decommissioned over total aircraft delivered). The taxonomy compliance of the revenues generated by the acquisition of a new aircraft after the entry into force of the taxonomy, when an old one is sold, will also be limited by a ratio of replacement, in order to ensure this sale would not expand the global fleet and therefore emissions. The ratio does not apply for capital expenditure. The capital expenditure for the acquisition of a new aircraft when an old one is decommissioned or sold is considered 100% taxonomy compliant (as a transition activity) in order to not limit financing for fleet replacement.

2) Aircraft efficiency requirements based on the ICAO new type (NT) CO_2 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 according to their maximum take-off mass.

A margin has been added to these three categories to accurately reflect the best in class performance across current commercial aircraft types and variants. This margin was set taking into account the European Aviation Safety Agency’s input and experience in certifying aircraft against the New Type limit of the ICAO CO_2 standard. Furthermore, it also takes into account the performance improvement in terms of the fuel efficiency and emissions of those aircraft compared to the previous generation aircraft and in terms of an alternative metric (CO_2 per

passenger km), which was not selected due to complexity and limitations of applying such a metric based on operational factors.

3) The requirement for aircraft to be certified to run on 100% sustainable aviation fuel certified from the beginning of 2028 is aimed at giving the assets included in the transition activity a long-term decarbonisation perspective, as most aircraft have a lifetime going above 20 years. In practice, this requirement will only make a difference if blends with more than 50% SAF are used in the future by aircraft operators. This requirement is meant to ensure aircraft manufacturers, which have no responsibility over the use of SAF by operators, still ensure that the technologies they deliver can support the use of 100% SAF in the future.

4) Manufacturers and service providers of parts and equipment used in taxonomy compliant aircraft as well as Maintenance, Repair and Overhaul (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 was set as a pathway to stimulate further CO_2 emissions reductions. The percentages are set 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. In order to meet the percentage of SAF requirements, operators shall calculate compliance on the basis of the amount of SAF used at fleet level divided by the total fuel actually used by best in class aircraft (meeting the criteria) multiplied by 100.

The activity includes the manufacture, repair, maintenance, overhaul, retrofitting, design, repurposing and upgrade of all types of aircraft, including but not limited to commercial passenger and freighter aircraft, military aircraft, helicopters and unmanned aircraft. However, when it comes to business aviation, aircraft equipped for private or business travel can only be taxonomy compliant if they are zero emissions. Given the business aviation segment can in most part be replaced by scheduled air services or train travel, there is no reason for this mode to be considered as making a substantial contribution to climate change mitigation unless it is operated by zero emission aircraft.

Further revision of the criteria

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.

In addition, the criteria can be revised to assess whether to integrate further aircraft technologies to the list of products covered by this NACE code, such as hybrid aircraft, but only when considering their substantial contribution to climate mitigation for the aviation sector.

7.3 Leasing of aircraft

Description of the activity

Renting and leasing of aircraft and aircraft parts and equipment.

The economic activities in this category could be associated in particular with NACE code 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. 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. A zero exhaust CO2 emission aircraft such as those powered by electricity or green hydrogen.

OR

2. An aircraft delivered before [the entry into force of the taxonomy], meeting NACE C30.3 criteria, multiplied by the ratio of [aircraft decommissioned / aircraft delivered] averaged over the last 10 years as evidenced by publically available and independently verified data (e.g., Cirium).

OR

3. An aircraft delivered after [the entry into force of the taxonomy] meeting criteria as defined in NACE C30.3, and either:
   A. acquired with the commitment that an aircraft not compliant with the margins to the New Type limit of the ICAO CO2 standard, with a size of at least 80% of max take-off weight of the new delivery, with proof of airworthiness dating back less than 6 months, is **decommissioned** within 6 months of delivery of the new aircraft. For capital expenditure and revenue reporting, the taxonomy eligibility is determined by the acquisition of a taxonomy compliant aircraft with the decommissioning of another aircraft in line with the criteria outlined in 3.A.

   B. OR acquired with the commitment that an aircraft not compliant with the margins to the New Type limit of the ICAO CO2 standard, with a size of at least 80% of max take-off weight of the new delivery, with proof of airworthiness dating back less than 6 months, **leaves the fleet** within 6 months of delivery of the new aircraft. For revenue reporting, the revenues associated with this acquisition shall be multiplied by the ratio of [aircraft decommissioned / aircraft delivered] averaged over the last 10 years as evidenced by publically available data (e.g., Cirium). For capital expenditure, the ratio does not apply and taxonomy eligibility is determined by the acquisition of a taxonomy compliant aircraft with a sale of another aircraft, in line with the criteria outlined in 3.B.

These criteria apply to the leasing of parts and equipment to the extent that they can be linked to an eligible aircraft type and improves or maintains the level of efficiency of the aircraft.

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. DNSH as set out in Appendix 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	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) Amendment 13 of Volume I (noise), Chapter 14, of Annex 16 to the Chicago Convention; (b) Amendment 10 of Volume II (engine emissions), Chapters 2 and 4, of Annex 16 to the Chicago Convention; (c) DNSH as set out in Appendix C of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852 (d) 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 of ensuring 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 rule to ensure taxonomy criteria does not contribute to increasing aircraft fleets and therefore emissions.

- For aircraft manufacturers the requirement is that eligible aircraft are restricted to those replacing existing less efficient aircraft. This requirement will be verified by identifying the ratio of aircraft being decommissioned 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 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. The share of taxonomy compliance of aircraft manufacturers is only for the percentage of best in class efficient aircraft delivered that are replacing older aircraft globally.

- For leasing companies, a decommissioning (permanent removal from service) or selling rule requires that the company proves that an old, non-taxonomy compliant aircraft was permanently removed or left its fleet to make a new, more efficient one eligible. In order to avoid companies using the taxonomy to write off aircraft investments currently not flying but parked in long term storage facilities, this decommissioning rule requires the decommissioned aircraft have been in service at least 6 months before the date of decommissioning. Leasing of aircraft 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 occurred before the entry into force of the criteria is not considered as taxonomy compliant. This is why for aircraft leased before the entry into force of the taxonomy, the taxonomy compliant revenue can be determined by the portion of the fleet that meets NACE C30.3 requirements multiplied by the global average replacement ratio (total aircraft decommissioned over total aircraft delivered). The taxonomy compliance of the revenues generated by the acquisition of a new aircraft after the entry into force of the taxonomy, when an old one is sold, will be limited by a ratio of replacement, in order to ensure this sale would not expand the global fleet and therefore emissions. The ratio does not apply for capital expenditure. The capital expenditure for the acquisition of a new aircraft when an old one is decommissioned or sold is considered 100% taxonomy compliant (as a transition activity) in order to not limit financing for fleet replacement.
- For aircraft operators, the criteria aim at ensuring the newly acquired aircraft replaces an older non-taxonomy compliant aircraft, by proving that the latter has been sold or

decommissioned. Air transport criteria 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 occurred before the entry into force of the criteria is not considered as taxonomy compliant. This is why for air transport operators, before the entry into force of the taxonomy, taxonomy compliant revenues can be determined by the portion of the fleet that meets NACE C30.3 requirements multiplied by the global average replacement ratio (total aircraft decommissioned over total aircraft delivered). The taxonomy compliance of the revenues generated by the acquisition of a new aircraft after the entry into force of the taxonomy, when an old one is sold, will also be limited by a ratio of replacement, in order to ensure this sale would not expand the global fleet and therefore emissions. The ratio does not apply for capital expenditure. The capital expenditure for the acquisition of a new aircraft when an old one is decommissioned or sold is considered 100% taxonomy compliant (as a transition activity) in order to not limit financing for fleet replacement.

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 according to their maximum take-off mass. When it comes to business aviation, aircraft equipped for private or business travel can only be taxonomy compliant if they are zero emissions. Given the business aviation segment can in most part be replaced by scheduled air services or train travel, there is no reason for this mode to be considered as making a substantial contribution to climate change mitigation unless it is operated by zero emission aircraft.

A margin has been added to these three categories to accurately reflect the best in class performance across current commercial aircraft types and variants. This margin was set taking into account the European Aviation Safety Agency's input and experience in certifying aircraft against the New Type limit of the ICAO CO2 standard. Furthermore, it also takes into account the performance improvement in terms of the fuel efficiency and emissions of those aircraft compared to the previous generation aircraft and in terms of an alternative metric (CO2 per passenger km), which however was not selected due to complexity and limitations of applying such a metric based on operational factors.

3) The requirement for aircraft to be certified to run on 100% sustainable aviation fuel certified from the beginning of 2028 is aimed at giving the assets included in the transition activity a long-term decarbonisation perspective, as most aircraft have a lifetime going above 20 years. In practice, this requirement will only make a difference if blends with more than 50% SAF are used in the future by aircraft operators. This requirement is meant to ensure aircraft

manufacturers, which have no responsibility over the use of SAF by operators, still ensure that the technologies they deliver can support the use of 100% SAF in the future.

4) On the operator side, a progressive increase in the use of SAF was set as a pathway to stimulate further CO2 emissions reductions. The percentages are set 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. In order to meet the percentage of SAF requirements, operators shall calculate compliance on the basis of: the amount of SAF used at fleet level divided by the total fuel actually used by best in class aircraft (meeting the criteria) multiplied by 100.

7.4 Passenger and freight air transport

Description of the activity

Purchase, financing and operation of aircraft including transport of passengers and goods (excluding activities covered by leasing of aircraft as defined in 7.2).

The economic activities in this category could be associated with NACE codes H51.1 and H51.21 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.

   OR

2. Performed by an aircraft acquired before [entry into force of the taxonomy], meeting C30.3 criteria in section 7.2 multiplied by the ratio of [aircraft decommissioned / aircraft delivered] averaged over the last 10 years as evidenced by publicly available

data (e.g., Cirium).

OR

3. Until 2030 performed using aircraft acquired after [entry into force of the taxonomy], meeting criteria as defined in section 7.2 for C30.3, and either:

    a) acquired with the commitment that an aircraft not compliant with margins to the New Type limits of the ICAO CO2 standard, with proof of airworthiness dating back less than 6 months and with a size of at least 80% of max take-off weight of the new delivery, **is decommissioned** within 6 months of delivery of the new aircraft. For capital expenditure and revenue reporting, the taxonomy eligibility is determined by the acquisition of a taxonomy compliant aircraft with the decommissioning of another aircraft in line with the criteria outlined in 3.A above.

    b) OR acquired with the commitment that an aircraft not compliant with margins to the New Type limits of the ICAO CO2 standard, with proof of airworthiness dating back less than 6 months and with a size of at least 80% of max take-off weight of the new delivery, **leaves the fleet** within 6 months of delivery of the new aircraft. For revenue reporting, the revenues associated with this acquisition shall be multiplied by the ratio of [aircraft decommissioned / aircraft delivered] averaged over the last 10 years as evidenced by publically available data (e.g., Cirium). For capital expenditure, the ratio does not apply and taxonomy eligibility is determined by the acquisition of a taxonomy compliant aircraft with a sale of another aircraft, in line with the criteria outlined in 3.B above.

4. From 2030 onwards, performed using aircraft meeting criteria [2 and 3] above and using a minimum quantity (tons) of 10% of Sustainable Aviation Fuels (SAFs) increased by 2 percentage points annually thereafter. The SAF requirement shall be calculated with reference to the total fuel used by the aircraft aligned with criteria [2 and 3] at the fleet level. Operators shall calculate compliance on the basis of: the amount of SAF used at fleet level divided by the total fuel actually used by best in class aircraft (meeting the criteria) multiplied by 100. SAFs are defined as renewable fuels of non-biological origin and biofuels produced from the feedstock listed in Annex IX of the Renewable Energy Directive.

    OR

5. Performed using aircraft operated with a minimum of 5% SAFs in 2022, with the percentage of SAF increasing by 2 percentage points annually thereafter. The SAF requirement shall be calculated with reference to the total fuel used at the fleet level. Operators shall calculate compliance on the basis of the amount of SAF used at fleet level divided by the total fuel actually used by the fleet multiplied by 100. SAFs are defined as renewable fuels of non-biological origin and biofuels produced from the feedstock listed in Annex IX of the Renewable Energy Directive.

Do no significant harm ('DNSH')	
(2) Climate change adaptation	DNSH as set out in Appendix A of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852, ensuring 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) Amendment 13 of Volume I (noise), Chapter 14, of Annex 16 to the Chicago Convention; b) Amendment 10 of Volume II (engine emissions), Chapters 2 and 4 of Annex 16 to the Chicago Convention; c) DNSH as set out in Appendix C of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852 d) 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 of ensuring 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 CO_2 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 CO_2 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 rule to ensure taxonomy criteria does not contribute to increasing aircraft fleets and therefore emissions.

- For aircraft manufacturers the requirement is that eligible aircraft are restricted to those replacing existing less efficient aircraft. This requirement will be verified by identifying the ratio of aircraft being decommissioned 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 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. The share of taxonomy compliance of aircraft manufacturers is only for the percentage of best in class efficient aircraft delivered that are replacing older aircraft globally.

- For leasing companies, a decommissioning (permanent removal from service) or selling rule requires that the company proves that an old, non-taxonomy compliant aircraft was permanently removed or left its fleet to make a new, more efficient one eligible. In order to avoid companies using the taxonomy to write off aircraft investments currently not flying but parked in long term storage facilities, this

decommissioning rule requires the decommissioned aircraft have been in service at least 6 months before the date of decommissioning. Leasing of aircraft should take into account previous efforts to improve the energy performance of fleets but also ensure that fleet expansion and overall growth in CO_2 emissions that has occurred before the entry into force of the criteria is not considered as taxonomy compliant. This is why for aircraft leased before the entry into force of the taxonomy, the taxonomy compliant revenue can be determined by the portion of the fleet that meets C30.3 requirements multiplied by the global average replacement ratio (total aircraft decommissioned over total aircraft delivered). The taxonomy compliance of the revenues generated by the acquisition of a new aircraft after the entry into force of the taxonomy, when an old one is sold, will be limited by a ratio of replacement, in order to ensure this sale would not expand the global fleet and therefore emissions. The ratio does not apply for capital expenditure. The capital expenditure for the acquisition of a new aircraft when an old one is decommissioned or sold is considered 100% taxonomy compliant (as a transition activity) in order to not limit financing for fleet replacement.

- For aircraft operators, the criteria aim at ensuring the newly acquired aircraft replaces an older non-taxonomy compliant aircraft, by proving that the latter has been sold or decommissioned. Air transport criteria 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 occurred before the entry into force of the criteria is not considered as taxonomy compliant. This is why for air transport operators, before the entry into force of the taxonomy, taxonomy compliant revenues can be determined by the portion of the fleet that meets C30.3 requirements multiplied by the global average replacement ratio (total aircraft decommissioned over total aircraft delivered). The taxonomy compliance of the revenues generated by the acquisition of a new aircraft after the entry into force of the taxonomy, when an old one is sold, will also be limited by a ratio of replacement, in order to ensure this sale would not expand the global fleet and therefore emissions. The ratio does not apply for capital expenditure. The capital expenditure for the acquisition of a new aircraft when an old one is decommissioned or sold is considered 100% taxonomy compliant (as a transition activity) in order to not limit financing for fleet replacement.

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 according to their maximum take-off mass.

A margin has been added to these three categories to accurately reflect the best in class performance across current commercial aircraft types and variants. This margin was set taking into account the European Aviation Safety Agency's input and experience in certifying aircraft against the New Type limit of the ICAO CO_2 standard. Furthermore, it also takes into account the performance improvement in terms of the fuel efficiency and emissions of those aircraft compared to the previous generation aircraft and in terms of an alternative metric (CO_2 per passenger km), which however was not selected due to complexity and limitations of applying such a metric based on operational factors.

3) The requirement for aircraft to be certified to run on 100% sustainable aviation fuel certified from the beginning of 2028 is aimed at to givinge the assets included in the transition activity a long-term decarbonisation perspective, as most aircraft have a lifetime going above 20 years. In practice, this requirement will only make a difference if blends with more than 50% SAF are used in the future by aircraft operators. This requirement is meant to ensure aircraft manufacturers, which have no responsibility over the use of SAF by operators, still ensure that the technologies they deliver can support the use of 100% SAF in the future.

4) On the operator side, a progressive increase in the use of SAF was set as a pathway to stimulate further CO_2 emissions reductions. The percentages are set 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) The taxonomy compliant revenue of air passenger transport should take into account efforts to improve the energy performance of fleets but also ensure that fleet expansion and overall growth in CO_2 emissions that has occured before the entry into force of the criteria is not considered as taxonomy compliant. This is why taxonomy compliant revenue can be determined by the portion of the fleet that meets C30.3 and N77.3.5 requirements multiplied by a global average replacement ratio (total aircraft decommissioned over total aircraft delivered) with the additional proof that new aircraft acquired actually replace older more polluting aircraft, either by selling them or decommissioning them.

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.

7.5 Air transportation ground handling operations

Description of the activity

Manufacture, repair, maintenance, overhaul, retrofitting, design, repurposing and upgrade, purchase, financing, renting, leasing and operation of equipment and service activities incidental to air transportation (ground handling), including 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 and equipment comes from a zero-emissions motor.

Do no significant harm ('DNSH')	
(2) Climate change adaptation	DNSH as set out in Appendix 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 Appendix 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 Appendix 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.).

8. Restoration, Remediation

8.1 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.[738] 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.[739]

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.

[738] 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)

[739] Non-administered conservation areas are areas over which a recorded conservation interest has been secured but not administered by the competent authority.

Substantial contribution to protection and restoration of biodiversity and ecosystems

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[740], the IUCN Guidelines for privately protected areas[741] 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[742];

[740] 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

[741] 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)

[742] 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 have 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[743];

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[744], 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[745] of relevant habitats and/or species and aims at achieving **good condition**, where this is not already the case, over a clearly defined timeframe.[746]

[743] Climate change vulnerability assessment is also a requirement of DNSH criteria for Climate Change Adaptation. A single assessment fulfils both criteria.

[744] 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).

[745] 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).

[746] The use of specific indicators and related targets based on existing scientific information and reflecting local conditions is recommended to determine the good condition of a habitat or a species.

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 good 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 In correspondence with the review of the conservation management plan or equivalent instrument every **five years** as defined under criterion 1.1 point (h) , the compliance of the revised plan with the present criteria is performed by either the relevant national competent authorities or by an independent third-party certifier such as a dedicated certificatio N/Accreditation scheme (VCA[747], 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.

[747] Voluntary Conservation | Earthmind

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) [748]. 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 In accordance with national law, the area on which the activity takes place is protected from conversion to other land use and deterioration by one of the following measures:

a) the area is classified as a protected area under any of the IUCN Categories[749] 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[750] approved by the competent authorities[751].

4.2 The owner of the area where the conservation activity takes place, commits to the public authority - as part of the Conservation Management Plan or an equivalent instrument - that future updates to the respective plan will not include conversion to other land use and continue to pursue the good condition of ecosystems as defined in the relevant national law[752].

5. Additional minimum requirements

5.1 In case the conservation activity is implemented in the context of and/or in relation to private or public infrastructure, primary production, industrial production, commercial activities or other services for which specific technical screening criteria for the substantial contribution to protection and restoration of biodiversity and ecosystems are defined, the conservation activity complies with these substantial contribution criteria as set out in the relevant Delegated Act.

5.2 The conservation activity is **not implemented with the purpose of offsetting** the impact of another economic activity.

5.3 Only activities compatible with the conservation objectives defined in the management plan or equivalent are allowed. 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, has been conducted and based on its conclusions the necessary mitigation measures are implemented.

c) Where applicable, the introduction of invasive alien species is prevented and/or their spread is managed in accordance with Regulation (EU) No 1143/2014.

[748] https://www.conservationfinance.info/business-planning-for-protected-areas

[749] Protected Area Categories | IUCN

[750] Only areas included under the EEZ of a sovereign country and over which the country has full jurisdiction.

[751] 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).

[752] 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)

Do no significant harm ('DNSH')

(1) Climate change mitigation	The activity does not involve the degradation of land with high carbon stock[753].
(2) Climate change adaptation	DNSH as set out in Appendix 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 Appendix 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 of occasions where the use of pesticides is needed to control outbreaks of pest and diseases.

[753] 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

	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[754], 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.[755] 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 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 use of impact, performance, best-in-class quantitative criteria unviable for this activity in the context of the Taxonomy:

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

[755] 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.

- 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 timespan 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 timespan** 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 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.

This set of techncial screening criteria relate to governance aspects that fall mainly under the responsibility of public authorities or private operators managing a conservation effort. Collectively these can be seen as quite burdensome for a single operator. Nevertheless, some of the individual criteria are in fact enabling measures to be framed as separate economic activities (in taxonomy terms) to which private investors could contribute (e.g., scientific research, monitoring, auditing, business planning etc.). It was not possible to develop technical screening criteria for these enabling measures because of time-constraints, but this shall be done in the next stages of the development of the taxonomy.

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[756];
- **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 areas, this element is captured by criteria based on best practice considerations;

[756] Draft note protected areas v2 TC.pdf (europa.eu)

- 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.

8.2 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 a land, freshwater or marine ecosystem to good condition 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 and/or in relation to private or public infrastructure, primary production, industrial production, commercial activities or other services 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

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[757] or, where national legislation does not define a restoration plan, as defined by the IUCN and the Society for Ecological Restoration (SER)[758], 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.

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[759], 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[760];

e) definition of the protection status of the area (if any);

[757] 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).

[758] Ecosystem Restoration | IUCN

[759] 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)

[760] IUCN Red List of Ecosystem methodology is used for this purpose - Red List of Ecosystems | IUCN

f) description of existing or planned human activities[761] 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);

h) assessment of risks and threats including their mitigation, including: a climate change vulnerability assessment and related adaptation measures[762]; the preventing the introduction or spreading of invasive species;

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[763] 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.[764]

[761] 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.

[762] Climate change vulnerability assessment is also a requirement of DNSH criteria for Climate Change Adaptation. A single assessment fulfils both criteria.

[763] 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).

[764] 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/

b) the need for restoration activity to regenerate or reinforce all relevant ecosystem functions so that the restoration can bring multiple benefits[765].

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

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 In correspondence with the review of the Restoration plan or equivalent instrument **every five years** as defined under criterion 1.1 point (i) , the compliance of the revised plan

[765] 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.

with the present criteria is performed by either the relevant national competent authorities or by an independent third-party certifier such as a dedicated certificatio N/Accreditation scheme (VCA[766], 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 In accordance with national law, the area on which the activity takes place is protected from conversion to other land uses and deterioration by one of the following measures:

a) the area is classified as a protected area under any of the IUCN Categories[767] 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[768].

3.2 The owner of the area where the restoration activity takes place, commits to the public authority - as part of the Restoration Plan or an equivalent instrument - that future updates to

[766] Voluntary Conservation | Earthmind

[767] Protected Area Categories | IUCN

[768] 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).

the respective plan will not include conversion to other land use and continue to pursue the good condition of ecosystems as defined in the relevant national law.[769]

4. Additional minimum requirements

4.1 In case the restoration activity is implemented in the context of and/or in relation to private or public infrastructure, primary production, industrial production, commercial activities or other services for which specific technical screening criteria for the substantial contribution to protection and restoration of biodiversity and ecosystems are defined, the restoration activity complies with these substantial contribution criteria as set out in the relevant Delegated Act.

4.2 The restoration activity is **not implemented with the purpose of offsetting** the impact of another economic activity.

4.3 Only activities compatible with the objectives defined in the restoration plan or equivalent are allowed. 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, has been conducted and based on its conclusions the necessary mitigation measures are implemented.

c) Where applicable, the introduction of invasive alien species is prevented and/or their spread is managed in accordance with Regulation (EU) No 1143/2014.

[769] 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)

Do no significant harm ('DNSH')	
(1) Climate change mitigation	The activity does not involve the degradation of land with high carbon stock.[770]
(2) Climate change adaptation	DNSH as set out in Appendix 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 Appendix 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 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.

[770] 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 .

	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[771], 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.[772] 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 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 timespan of several years.

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

[772] 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).

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 timespan** 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 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.

This set of techncial screening criteria relate to governance aspects that fall mainly under the responsibility of public authorities or private operators managing a restoration effort. Collectively these can been seen as quite burdensome for a single operator. Nevertheless, some of the individual criteria are in fact enabling measures to be framed as separate economic activities (in taxonomy terms) to which private investors could contribute (e.g., scientific research, monitoring, auditing, planning etc.). It was not possible to develop technical screening criteria for these enabling measures because of time-constraints, but this shall be done in the next stages of the development of the taxonomy.

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[773]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;

[773] 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.

8.3 Restoration of ecosystems

Description of the activity

Ecosystem restoration refers to a process or activity that, passively or actively, assists the recovery of a land, freshwater or marine ecosystem to good condition 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 and/or in relation to private or public infrastructure, primary production, industrial production, commercial activities or other services 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[774] 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[775] consistent with the expected lifetime of the activity, including, at least, 10 to 30 years climate projections scenarios for major investments.

[774] 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

[775] 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[776], scientific peer-reviewed publications and open source[777] 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[778] or rely on blue or green infrastructure[779] 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,

[776] 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/.

[777] Such as Copernicus services managed by the European Commission.

[778] 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/).

[779] 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	The activity does not involve the degradation of land, marine and inland freshwaters with high carbon stock[780].
(3) Sustainable use and protection of water and marine resources	DNSH as set out in Appendix 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 Article 2, point (21), of Regulation (EU) 2020/852, in accordance with Directive 2008/56/EC.
(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

([780]) 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 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[781], 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.[782] 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:

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

[782] 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).

	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).

8.4 Remediation activities

8.4.1 The sustainable use and protection of water and marine resources

Description of the activity

This activity includes:

- decontamination and/or remediation of soils and groundwater in the polluted area, either in situ or ex situ, using e.g., mechanical, physical, chemical or biological methods
- decontamination and/or remediation of industrial plants or sites, including nuclear plants and sites
- decontamination and/or remediation of surface water and its shores following accidental pollution, e.g., through collection of pollutants or through physical, chemical or biological methods
- cleaning up oil spills and other pollutions on/in:
    - Surface water (WFD):
        - Rivers
        - Lakes
        - Coastal waters
        - Transitional waters
    - Groundwater (as defined in the Water Framework Directive - WFD[783])
    - Marine water (as defined in the Marine Strategy Framework Directive - MSFD[784])
    - Sediments (for all surface water types)
    - Aquatic ecosystems
    - Buildings

[783] 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')

[784] 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')

    - Soil
    - Terrestrial ecosystems
- material abatement of hazardous substances, e.g., asbestos, lead-based paint
- 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.
- containment operations, hydraulic barriers, active and passive barriers intended to limit/prevent migration of pollutants

In addition, it includes all activities that are required to prepare, plan and follow-up the decontamination and/or remediation 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
- protection of workers, site access control, management of invasive species before/during decontamination and/or remediation, reinforcement operations carried out prior to or during decontamination

This activity excludes:

- Pest control in agriculture
- 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
- outdoor sweeping and watering of streets

The economic activities in this category could be associated with several NACE codes, in particular 39, 33.20, 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 sustainable use and protection of water and marine resources

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The activity fulfils cumulatively all criteria below:

1 Remediation measures: All criteria below are fulfilled:

1.1. Remediation activities are not carried out by the operator[785] that caused the pollution or anyone on its behalf in order to comply with the Environmental Liability Directive (2004/35/CE) or with environmental liability provisions based on the 'polluter-pays' principle according to national law.

1.2. 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[786], as defined by:

a) national regulatory standards established to implement the provisions of

i. Directive 2000/60/EC and EU standards established under Directive 2000/60/EC[787] or

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[785] 'operator' means any natural or legal private or public person who operates or controls the occupational activity or, where this is provided for in national legislation, to whom decisive economic power over the technical functioning of such an activity has been delegated, including the holder of a permit or authorisation for such an activity or the person registering or notifying such an activity (art. 2, Directive 2004/35/CE)

[786] Directive 2004/35/CE on environmental liability with regard to the prevention and remedying of environmental damage, Annex II, point 2.

[787] 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)

ii. Directive 2008/56/EC[788], 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 site-specific 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[789],[790].

1.3. The remediation activity is conducted in line with best industry practice and including all of the following elements:

a. The original source of polluting emissions[791] is removed permanently before any assessment or remediation activity is undertaken (except long-range transboundary air pollution or other unidentifiable diffuse sources);

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. The results of such investigations are used to define the environmental targets for the remediation and evaluate the remedial options. 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.[792]

[788] 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)

[789] Directive 2004/35/CE on environmental liability with regard to the prevention and remedying of environmental damage, Annex II, point 2.

[790] 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.

[791] ´Emission´ means the release in the environment, as a result of human activities, of substances, preparations, organisms or micro-organisms (art. 2, Directive 2004/35/CE)

[792] 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

c. The remedial options are analysed in line with Annex II of EU Directive 2004/35/CE[793],[794] and the most suitable remedial measures are defined in a dedicated remediation plan, including monitoring requirements and plan..

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. Control, monitoring or maintenance activities in the after-care phase of at least 10 years, unless a different duration sufficient to guarantee long-term risk control is defined in the national law or in the remediation and monitoring plan (see point 1.4).

1.4. The remediation and pollution monitoring plan is approved by the competent authority in accordance with national legal requirements, following consultation with local stakeholders;

2 Restoration 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:

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)

[793] Directive 2004/35/CE on environmental liability with regard to the prevention and remedying of environmental damage, Annex II, point 1.3.1.

[794] For activities in third countries, in accordance with equivalent applicable national law or international standards (e.g., 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) requiring remediation based on an alternative, transparently described process and valuation approach to define a suitable strategy, which comprises primary remedial measures (including monitoring requirements), complementary and compensatory remedial measures in a dedicated remediation plan..

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[795] 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

[795] Environmental Quality Standards Directive (2008/105/EC); Groundwater Directive (2006/118/EC)

body or bodies, in consultation with relevant stakeholders, in accordance with Directive 2000/60/EC of the European Parliament and of the Council[796].

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) Any extraction of water is carried out in accordance with best practices for the respective further use case and does not result in a deterioration of the ecological, chemical, quantitative and environmental status of the water body as set out in Directive 2000/60/EC or in Directive 2008/56/EC.

4 Guarantee of permanence

All criteria below are fulfilled:

4.1. In accordance with national law, the water body and/or land area on which the activity takes place is protected from conversion and deterioration 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;

[796] 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) 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[797] 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, and the owner of the water body (if other than the owner of the area) commit to the public authority - as part of the restoration plan - that future updates to the respective plan will not result in activities leading to a deterioration of the ecological, chemical, quantitative and environmental status of the waterbody 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 criteria 1, 2, 3 and 4 above as well as the compliance with the DNSH criteria is verified by either of the following:

a) the relevant national competent authorities;

b) OR an independent third-party certifier, at the request of national authorities or the operator of the activity.

The independent third-party certifier 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.

[797] Protected Area Categories | IUCN

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[798]. Measures to reduce scope 1 and scope 2 GHG emissions of the full removal and/or treatment process are included in the remediation and monitoring plan.
(2) Climate change adaptation	DNSH as set out in Appendix A 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, 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 Appendix 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

[798] 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 .

	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 Appendix 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. Where applicable, 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[799]. 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

[799] 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).

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[800], 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

[800] Directive 2004/35/CE on environmental liability with regard to the prevention and remedying of environmental damage, Annex II, point 1.3.1.

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 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 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[801], 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.

[801] 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 ... ´.*

8.4.2 The transition to a circular economy

Description of the activity

This activity includes:

- decontamination and/or remediation of soils and groundwater in the polluted area, either in situ or ex situ, using e.g., mechanical, physical, chemical or biological methods
- decontamination and/or remediation of industrial plants or sites, including nuclear plants and sites
- decontamination and/or remediation of surface water and its shores following accidental pollution, e.g., through collection of pollutants or through physical, chemical or biological methods
- cleaning up oil spills and other pollutions on/in:
    - Surface water (WFD):
        - Rivers
        - Lakes
        - Coastal waters
        - Transitional waters
    - Groundwater (as defined in the Water Framework Directive - WFD[802])
    - Marine water (as defined in the Marine Strategy Framework Directive - MSFD[803])
    - Sediments (for all surface water types)
    - Aquatic ecosystems
    - Buildings
    - Soil
    - Terrestrial ecosystems

[802] 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')

[803] 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')

- material abatement of hazardous substances, e.g., asbestos, lead-based paint
- 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.
- containment operations, hydraulic barriers, active and passive barriers intended to limit/prevent migration of pollutants

In addition, it includes all activities that are required to prepare, plan and follow-up the decontamination and/or remediation 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
- protection of workers, site access control, management of invasive species before/during decontamination and/or remediation, reinforcement operations carried out prior to or during decontamination

This activity excludes:

- Pest control in agriculture
- 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
- outdoor sweeping and watering of streets

The economic activities in this category could be associated with several NACE codes, in particular 39, 33.20, 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. Remediation activities are not carried out by the operator[804] that caused the pollution or anyone on its behalf in order to comply with the Environmental Liability Directive (2004/35/CE) or with environmental liability provisions based on the 'polluter-pays' principle according to national law.

2. 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[805],[806].

[804] 'operator' means any natural or legal private or public person who operates or controls the occupational activity or, where this is provided for in national legislation, to whom decisive economic power over the technical functioning of such an activity has been delegated, including the holder of a permit or authorisation for such an activity or the person registering or notifying such an activity (art. 2, Directive 2004/35/CE)

[805] Directive 2004/35/CE on environmental liability with regard to the prevention and remedying of environmental damage, Annex II, point 2.

[806] 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

3. The remediation activity is conducted in line with best industry practice and including all of the following elements:

a) The original source of polluting emissions[807] is removed permanently before any assessment or remediation activity is undertaken (except long range transboundary air pollution or other unidentifiable diffuse sources);

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. The results of such investigations are used to define the environmental targets for the remediation and evaluate the remedial options. An estimate of the type and quantity of hazardous material is provided and validated by an economic actor independent from the operator performing the remediation.

c) The remedial options are analysed in line with Annex II of EU Directive 2004/35/CE[808,809] and the most suitable remedial measures are defined in a dedicated remediation plan, including monitoring requirements and plan;

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.

Guidance on the management of contaminated sites (UNEP/MC/COP.3/8/Rev.1) - Guidance_Contaminated_Sites_EN.pdf (mercuryconvention.org)

[807] ´Emission´ means the release in the environment, as a result of human activities, of substances, preparations, organisms or micro-organisms (art. 2, Directive 2004/35/CE)

[808] Directive 2004/35/CE on environmental liability with regard to the prevention and remedying of environmental damage, Annex II, point 1.3.1.

[809] For activities in third countries, in accordance with equivalent applicable national law or international standards (e.g., 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) requiring remediation based on an alternative, transparently described process and valuation approach to define a suitable strategy, which comprises primary remedial measures (including monitoring requirements), complementary and compensatory remedial measures in a dedicated remediation plan.

f) Control, monitoring or maintenance activities in the after-care phase of at least 10 years, unless a different duration sufficient to guarantee long-term risk control is defined in the national law or in the remediation and monitoring plan.

4. 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.

5. At lest one of the criteria below is fulfilled:

a) 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 sustainable contribution to CE in line with criteria established under the Sustainable Finances Taxonomy

OR

b) At least 90% by weight of all non-hazardous naturally occurring materials[810] made available and handled during the remediation operation are reused in situ or prepared for reuse ex-situ, AND at least 90% by weight of all non-hazardous 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. The weight of isolated hazardous materials sent to dedicated facilities corresponds with a 10% margin of error to the amount estimated in the remediation plan as part of point 3.b.

[810] Defined in category 17 05 04 in the European List of Waste established by Decision 2000/532/EC

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[811]. 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 Appendix 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 Appendix 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.
(5) Pollution prevention and control	DNSH as set out in Appendix 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).

[811] 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

(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appendix 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. Where applicable, 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 criterion to ensure that the remediated non hazardous 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, unless justified not feasible for environmental or technical reasons other than cost consideration.

- 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 and isolate hazardous materials, 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 potentially including 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 naturally occurring waste materials from excavated areas, defined in category 17 05 04 in the European List of Waste established by Decision 2000/532/EC.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 non hazardous 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. It is also essential to ensure a proper isolation of hazardous materials from any other reusable or recyclable materials, including

naturally occurring waste in order not to hamper the reuse or recycling of materials. That's why it is required to establish a comprehensive sorting system and verify that the hazardous materials correspond to the amount estimated in the remediation plan.

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 at least one of the two criteria between 5a or 5b is 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[812], 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 remediated materials versus materials sent to landfill and incineration (possibly conditioning some final payments), with a specific attention paid to the amount of hazardous materials, to be sent to dedicated facilities, compared to the amount estimated in the remediation plan.

[812] Directive 2004/35/CE on environmental liability with regard to the prevention and remedying of environmental damage, Annex II, point 1.3.1.

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 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.

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

8.4.3 Pollution prevention and control

Description of the activity

This activity includes:

- decontamination and/or remediation of soils and groundwater in the polluted area, either in situ or ex situ, using e.g., mechanical, physical, chemical or biological methods
- decontamination and/or remediation of industrial plants or sites, including nuclear plants and sites
- decontamination and/or remediation of surface water and its shores following accidental pollution, e.g., through collection of pollutants or through physical, chemical or biological methods
- cleaning up oil spills and other pollutions on/in:
    - Surface water (WFD):
        - Rivers
        - Lakes
        - Coastal waters
        - Transitional waters

- Groundwater (as defined in the Water Framework Directive - WFD[813])
- Marine water (as defined in the Marine Strategy Framework Directive - MSFD[814])
- Sediments (for all surface water types)
- Aquatic ecosystems
- Buildings
- Soil
- Terrestrial ecosystems

- material abatement of hazardous substances, e.g., asbestos, lead-based paint
- 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.
- containment operations, hydraulic barriers, active and passive barriers intended to limit/prevent migration of pollutants

In addition, it includes all activities that are required to prepare, plan and follow-up the decontamination and/or remediation 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

[813] 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')

[814] 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')

- protection of workers, site access control, management of invasive species before/during decontamination and/or remediation, reinforcement operations carried out prior to or during decontamination

This activity excludes:

- Pest control in agriculture
- 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
- outdoor sweeping and watering of streets

The economic activities in this category could be associated with several NACE codes, in particular 39, 33.20, 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. Remediation activities are not carried out by the operator[815] that caused the pollution or anyone on its behalf in order to comply with the Environmental Liability Directive (2004/35/CE) or with environmental liability provisions based on the 'polluter-pays' principle according to national law.

[815] 'operator' means any natural or legal private or public person who operates or controls the occupational activity or, where this is provided for in national legislation, to whom decisive economic power over the technical functioning of such an activity has been delegated, including the holder of a permit or authorisation for such an activity or the person registering or notifying such an activity (art. 2, Directive 2004/35/CE)

2. 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 and the environment[816], as defined by:

   a) national regulatory standards OR, where these standards are not available,

   b) a site-specifc 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[817].

3. The remediation activity is conducted in line with best industry practice and including all of the following elements:

   a) The original source of polluting emissions[818] is removed permanently before any assessment or remediation activity is undertaken (except long-range transboundary air pollution or other unidentifiable diffuse sources);

   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. The results of such investigations are used to define the environmental targets for the remediation and evaluate the remedial options. ;

[816] Directive 2004/35/CE on environmental liability with regard to the prevention and remedying of environmental damage, Annex II, point 2.

[817] Directive 2004/35/CE on environmental liability with regard to the prevention and remedying of environmental damage, Annex II, point 2. For activities in third countries, unless more stringent standards are mandatory under national legislation, reference is made to 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.

[818] ´Emission´ means the release in the environment, as a result of human activities, of substances, preparations, organisms or micro-organisms (art. 2, Directive 2004/35/CE)

c) The remedial options are analysed in line with Annex II of EU Directive 2004/35/CE[819,820] and the most suitable remedial measures are defined in a dedicated remediation plan, including monitoring requirements and plan.

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 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) Control, monitoring or maintenance activities in the after-care phase of at least 10 years, unless a different duration sufficient to guarantee long-term risk control is defined in the national law or in the remediation and monitoring plan (see point 4)

4. The specific remediation and monitoring plan is approved by the competent authority in accordance with national legal requirements, following consultation with local stakeholders.

[819] Directive 2004/35/CE on environmental liability with regard to the prevention and remedying of environmental damage, Annex II, point 1.3.1.

[820] For activities in third countries, in accordance with equivalent applicable national law or international standards (e.g., 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) requiring remediation based on an alternative, transparently described process and valuation approach to define a suitable strategy, which comprises primary remedial measures (including monitoring requirements), complementary and compensatory remedial measures in a dedicated remediation plan.

Do no significant harm ('DNSH')	
(1) Climate change mitigation	The activity does not involve the degradation of land with high carbon stock.[821] 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 Appendix 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 Appendix 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.

[821] Land with high-carbon stock means wetlands, including peatland, and continuously forested areas grasslands, mangroves and seagrass meadows within the meaning of Article 29(4)(a), (b) and (c) of Directive (EU) 2018/2001, the EU Biodiversity Strategy for 2030 and the Draft Technical Note on Criteria and Guidance for Protected Areas.

(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appendix 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. Where applicable, 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[822] 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.

[822] Directive 2004/35/CE on environmental liability with regard to the prevention and remedying of environmental damage, Annex II, point 1.3.1.

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 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[823], but it could reveal too restrictive for some remediation activities

[823] 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)*

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 is added (extracted from Annex I to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852 – Restoration of Wetlands).

8.4.4 The protection and restoration of biodiversity and ecosystems

Description of the activity

This activity includes:

- decontamination and/or remediation of soils and groundwater in the polluted area , either in situ or ex situ, using e.g., mechanical, physical, chemical or biological methods
- decontamination and/or remediation of industrial plants or sites, including nuclear plants and sites
- decontamination and/or remediation of surface water and its shores following accidental pollution, e.g., through collection of pollutants or through physical, chemical or biological methods
- cleaning up oil spills and other pollutions on/in:
    - Surface water (WFD):
        - Rivers
        - Lakes
        - Coastal waters

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 ... ´.

        - Transitional waters
    - Groundwater (as defined in the Water Framework Directive - WFD[824])
    - Marine water (as defined in the Marine Strategy Framework Directive - MSFD[825])
    - Sediments (for all surface water types)
    - Aquatic ecosystems
    - Buildings
    - Soil
    - Terrestrial ecosystems
- material abatement of hazardous substances, e.g., asbestos, lead-based paint
- 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.
- containment operations, hydraulic barriers, active and passive barriers intended to limit/prevent migration of pollutants

In addition, it includes all activities that are required to prepare, plan and follow-up the decontamination and/or remediation 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)

[824] 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')

[825] 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')

- Earth moving/dredging: excavation, landfilling, levelling and any other activities necessary to operate the decontamination
- protection of workers, site access control, management of invasive species before/during decontamination and/or remediation, reinforcement operations carried out prior to or during decontamination

This activity excludes:

- Pest control in agriculture
- 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
- outdoor sweeping and watering of streets

The economic activities in this category could be associated with several NACE codes, in particular 39, 33.20, 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

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The activity fulfils cumulatively all criteria below:

1. **Remediation measures:** All criteria below are fulfilled:

1.1 Remediation activities are not carried out by the operator[826] that caused the pollution or anyone on its behalf in order to comply with the Environmental Liability Directive

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[826] 'operator' means any natural or legal private or public person who operates or controls the occupational activity or, where this is provided for in national legislation, to whom decisive economic power over the technical functioning of such an activity has been delegated, including the holder of a permit or authorisation for such an activity or the person registering or notifying such an activity (art. 2, Directive 2004/35/CE)

(2004/35/CE) or with environmental liability provisions based on the 'polluter-pays' principle according to national law.

1.2 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[827], as defined by:

a) national regulatory standards[828],

OR, where these standards are not available,

b) a site-specific 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 [829],[830].

1.3 The remediation activity is conducted in line with best industry practice and including all of the following elements:

a) The original source of polluting emissions[831] is removed permanently before any assessment or remediation activity is undertaken (except long-range transboundary air pollution or other unidentifiable diffuse sources);

[827] Directive 2004/35/CE on environmental liability with regard to the prevention and remedying of environmental damage, Annex II, point 2.

[828] 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.

[829] Directive 2004/35/CE on environmental liability with regard to the prevention and remedying of environmental damage, Annex II, point 2.

[830] 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.

[831] ´Emission´ means the release in the environment, as a result of human activities, of substances, preparations, organisms or micro-organisms (art. 2, Directive 2004/35/CE)

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. The results of such investigations are used to define the environmental targets for the remediation and evaluate the remedial options.

c) The remedial options are analysed in line with Annex II of EU Directive 2004/35/CE[832]–[833] and the most suitable remedial measures are defined in a dedicated remediation plan, including monitoring requirements and plan.

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) Control, monitoring or maintenance activities in the after-care phase of at least 10 years, unless a different duration sufficient to guarantee long-term risk control is defined in the national law or in the remediation and monitoring plan (see point 1.4)

1.3 The remediation and pollution monitoring plan is approved by the competent authority in accordance with national legal requirements, following consultation with local stakeholders;

2. Restoration measures: All criteria below are fulfilled:

[832] Directive 2004/35/CE on environmental liability with regard to the prevention and remedying of environmental damage, Annex II, point 1.3.1.

[833] For activities in third countries, in accordance with equivalent applicable national law or international standards (e.g., 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) requiring remediation based on an alternative, transparently described process and valuation approach to define a suitable strategy, which comprises primary remedial measures (including monitoring requirements), complementary and compensatory remedial measures in a dedicated remediation plan..

2.1 The remediated land area or waterbody is destined to a restoration activity fully complying with the substantial contribution criteria as set out under the economic activity ´Restoration of Biodiversity and Ecosystems´ in the relevant Delegated Act.

2.2 Restoration measures as defined in a dedicated Restoration Plan or an equivalent instrument covering the whole period considered necessary to achieve the restoration goals and accepted by the competent authority.

2.3 Any economic use of the remediated area under restoration is compatible with the restoration objectives of the area as defined in the Restoration Plan or an equivalent instrument and does not cause any deterioration to biodiversity.

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[834]. 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 Appendix 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 Appendix 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.

[834] 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 Appendix 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).

9. Water supply

9.1 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 food business operators 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

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- For the **operation of an existing** water supply system to provide water supply in a sufficient and healthy quality to consumers, and contribute to water resource efficiency, the SC is achieved by the following:
    - The water supply system complies with the requirements of the Drinking Water Directive (and the recast Drinking Water Directive once applicable), including the requirements set under Article 13(8) and in the Commission Implementing Decision establishing a watch list of substances and compounds of concern for water intended for human consumption. [C(2022) 142 final]
    - The system has received the necessary permits for water abstraction and is included in a water use and resource management plan issued by relevant authority based on obligations in the Water Framework Directive (Directive 2000/60/EC), the Groundwater Directive, and the Drinking Water Directive, securing local water

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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 system is either calculated using the Infrastructure Leakage Index (ILI)[835] rating method and the threshold value equals to or is lower than **2.0**, 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[836]. That calculation is to be applied across the extent of a specified part of a water supply (distribution) network, 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, where water is delivered to contractual delivery point of the consumers' own subsystem.

- 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 (thereby increasing local consumers' access to water) the SC is achieved by the following:

  - The water supply system complies with the requirements of the Drinking Water Directive (and the recast Drinking Water Directive once applicable), including the requirements set under Article 13(8) and in the Commission Implementing Decision establishing a watch list of substances and compounds of concern for water intended for human consumption. [C(2022) 142 final]
  - The system has received the necessary permits for water abstraction and is included in a water use and resource management plan issued by relevant authority

[835] 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.

[836] 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).

based on obligations in the Water Framework Directive (Directive 2000/60/EC), the Groundwater Directive, and the Drinking Water Directive, 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)[837] 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[838]. That calculation is to be applied across the extent of the affected and specified part of a 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 system will include metering at consumer level, where water is delivered to contractual delivery point of the consumers' own subsystem.

- **For renewal** of existing water supply systems, the SC is met by the following:

  - Closing the gap to a leakage level as described above 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 the affected and specified part of a water supply (distribution) network where the works are carried out i.e., for the

[837] 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.

[838] 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).

renewed water supply (distribution) network at district metered area(s) (DMAs) or pressure managed area(s) (PMAs).

- A plan with goals and timelines for implementing metering at consumer level (if it does not already exist), which must be issued by the water supplier in collaboration with relevant authorities.

Do no significant harm ('DNSH')

(1) Climate change mitigation	N/A
(2) Climate change adaptation	DNSH as set out in Appendix 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 Appendix D of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.

Rationale

Construction and operation of 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 to the population, for the food business’ production purposes (DIRECTIVE (EU) 2020/2184[839]), 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, a River Basin Management Plan following the Water Framework Directive, or any other relevant plan at river basin level, also established by the competent authorities in water management. 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 fulfil local requirements as well as requirements from the Water Framework Directive, the Groundwater Directive, and the revised Drinking water directive when it enters into force. 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

[839] 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).

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. Operation, 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 on the Paper no. 8 in Water Supply and Sanitation Discussion Paper Series from The World Bank[840], an Infrastructure Leakage Index (ILI) **of 2.0** or less will characterize in general a well-managed existing water supply system. This leakage rate is set as a reference for existing water supply systems. As per the Drinking Water Directive other indicators can be used to quantify the leakage levels in a system.

As set out in the document "JRC Best Environmental Management Practice for the Public Administration Sector. 2019"[841], the benchmark of excellence in the leakage level is an ILI **lower than 1.5**. This is set as reference for new supply systems or when rehabilitating existing supply systems to achieve substantial contribution. 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 up to an ILI of 1.5 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.

LEAKSuite Library Limited[842] showcase on their homepage a similar threshold for ILI with a number of identified water utilities throughout Europe and the world.

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[840] The Challenge of Reducing Non-Revenue Water (NRW) in Developing Countries. How the Private Sector Can Help: A Look at Performance-Based Service Contracting

Bill Kingdom, Roland Liemberger, Philippe Marin, Water Supply and Sanitation Board Discussion Paper Series, Paper No. 8, The World Bank, Washington, DC, December 2006.

https://documents1.worldbank.org/curated/en/385761468330326484/pdf/394050Reducing1e0water0WSS81PUBLIC1.pdf

[841] 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

[842] LEAKSuite Library Limited. (https://www.leakssuitelibrary.com/ - browsed December 2021)

A **new system** is a system that is constructed, proved and checked for full delivery of safe drinking water to the area it is meant to supply to. This will usually be proven by a contract or any other contractual relation, or by a project description that states when the responsibility goes from one part of a contract to the other.

A **renewal** of a water supply system, is defined, when it is already in operation delivering safe drinking water according to the Drinking Water Directive. A project plan will describe where the system is expanded or renewed, also when using a step-by-step approach. The different steps are described, and it is set when they are proved finished and ready for delivering drinking water at any part of the affected and identified system.

In the context of a conservation 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.

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. 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.

10. Sewerage

10.1 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: 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

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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[843] (UWWTD- Council Directive 91/271/EEC of 21 May 1991 concerning urban waste-water treatment).

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 a sludge treatment such as

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[843] Council Directive 91/271/EEC of 21 May 1991 concerning urban waste-water treatment (OJ L 135, 30.5.1991, p. 40)

anaerobic digestion or a technology with the same or a lower net energy demand (considering both energy generation and consumption) to stabilize the sludge.

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.[844]
(2) Climate change adaptation	DNSH as set out in Appendix 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[845] 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

[844] For example, following IPCC guidelines for national GHG inventories for waste water treatment https://www.ipcc-nggip.iges.or.jp/public/2019rf/pdf/5_Volume5/19R_V5_6_Ch06_Wastewater.pdf).

[845] Council Directive 91/271/EEC of 21 May 1991 concerning urban waste-water treatment (OJ L 135, 30.5.1991, p. 40)

	flush. Sewage sludge is used in accordance with Council Directive 86/278/EEC[846] or as required by national law.
(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appendix 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[847].

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 wastewater. If wastewater is discharged untreated into water bodies (such as inland surface waters, transitional waters, groundwater, coastal waters and marine waters), it deteriorates their ecological and chemical status.

[846] 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).

[847] https://ec.europa.eu/environment/water/water-urbanwaste/info/pdf/terms.pdf

Wastewater treatment is a cornerstone of the Water Framework Directive[848] (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 treatment that is even more stringent 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 wastewater treatment plants treat the wastewater in an energy and resource-efficient way, compared with the aerobic treatment alternative. This criterion is set as best practice in the document 'JRC Best Environmental Management Practice for the Public Administration

[848] Water Framework Directive 2000/60/EC

Sector. 2019'[849]. Future and current niche technologies can prove their efficiency by comparing their net energy demand to that of anaerobic digestion, guaranteeing a technological openness.

The DNSH criteria are basically the ones considered in the First Delegated Act (Annexes I and II) in relation to the very similar activity '*Construction, extension and operation of waste water collection and treatment*' with two suggested changes. First, the DNSH for PPC has been adapted to also allow for other uses of sewage sludge other than the spreading on land (e.g., mono incineration and P-recovery). Second, a footnote has been added to the CCM DNSH to clarify the expected assessment of GHG emissions on the WWTP level.

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 any other activity or activities.

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.

10.2 Phosphorus recovery from waste water

Description of the activity

The activity covers the construction and operation of the necessary facilities for recovering phosphorus from on-site wastewater treatment plants (WWTP) (aqueous phase and sludge) and from materials (i.e., ashes) after thermal oxidation (i.e., incineration) of sewage sludge.

The activity covers the phosphorus recovery but does not include the use of the recovered material.

[849]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 P-salts such as Struvite–magnesium ammonium phosphate, $NH_4MgPO_4 \cdot 6H_2O$), P recovery processes will recover at least **15%** 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 thermal oxidation with chemical P recovery or (ii) after sewage sludge thermal oxidation with thermo chemical P recovery the process will recover at least **80%** of the incoming P load from the respective input material like sewage sludge ash.

In both cases, the P actually extracted out of the system will be a material with a real market demand linked to the contained P ensuring its reasonable functional use (in case of being used as fertilizer compliant with the Regulation (EC) No. 2003/2003 of the European Parliament and of the Council relating to fertilizers and future updated Fertilizer Regulation or national fertilizers legislation if more stringent). For other fields of application, where the recovered P fulfils specified functions, the respective regulations apply.

Do no significant harm ('DNSH')

(1) Climate change mitigation	N/A.
(2) Climate change adaptation	DNSH as set out in Appendix A of Annex I to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.

(3) Sustainable use and protection for 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[850] 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[851], 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[852]; (b) the best available techniques (BAT) conclusions for common wastewater and waste gas treatment/management systems in the chemical sector[853]. No significant cross-media effects occur.

[850] 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.

[851] 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).

[852] 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).

[853] Implementing Decision (EU) 2016/902.

(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appendix 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 mined mineral phosphate resources in the EU. 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 white 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 to a high extent 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.[854] Therefore, the activity

[854] https://www.tab-beim-bundestag.de/de/pdf/publikationen/themenprofile/Themenkurzprofil-039.pdf

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.[855] 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 (12/15 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 15% is set for achieving SC considering that according to the study "P-REX. *Sustainable sewage sludge management fostering phosphorus recovery and energy efficiency*[856]" 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 white phosphorus P4, the highest grade of P, out of mined phosphates is an energy-intensive process which is strongly dependent on locally sourced electricity. It is estimated that approximately 14 MWh[857] of electricity is required for each ton of P4 produced. In addition, the

[855] Bundesgesetzblatt Jahrgang 2017 Teil I Nr. 65, ausgegeben am 02.10.2017, Seite 3465: Verordnung zur Neuordnung der Klärschlammverwertung vom 27.09.2017

[856] Project supported by the European Commission within the Seventh Framework Programme Grant agreement No. 308645. 2015

[857] Technical proposals for selected new fertilising materials under the Fertilising Products Regulation (Regulation (EU) 2019/1009)

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 criterion 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.

10.3 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. "Reclaimed Water" means urban wastewater 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.
- Facilities for harvesting rain and stormwater
- Facilities for collection and treatment of grey water. "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.

These systems can be used for aquifer recharge, irrigation, industrial reuse, recreation and any other municipal use.

It should be noted that this activity only includes the facilities and processes that make it possible for the water to be reused (e.g., facilities for recharging aquifers or surface water storages), 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

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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). For other reclaimed water uses than agricultural irrigation, the final quality is fit for purpose and compliant with existing national legislation and standards.

- 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 and must not include wastewater.

- The water must be suitable for use after proper treatment depending on the level of contamination and ulterior use.

- 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[858]. The results are disclosed to investors and clients on demand.
(2) Climate change adaptation	DNSH as set out in Appendix 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[859] 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[860] and includes an assessment of the impact on water in accordance with Directive 2000/60/EC, no additional assessment of

[858] 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)

[859] 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.

[860] 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). The reuse will fulfil additional national legislation in this matter (if stricter).
(5) Pollution prevention and control	For the uses prescribed in the EU Regulation (EU) 2020/741, the regulation or national legislation (if stricter) must be fulfilled. Aquifer recharge and Infiltration of surface runoff waters shall comply with the Ground Water Directive (2006/118/EC) or national legislation (if stricter).
(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appendix 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.[861]

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.

[861] 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 wastewater 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**[862] 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.

10.4 Sustainable urban drainage systems (SUDS)

Description of the activity

The activity "*Sustainable Urban Drainage Systems (SUDS)*" includes the construction, maintenance, and operation of facilities that help to improve both the urban water quality and the urban water quantity. The facilities aim to align modern drainage systems with natural water processes. They could also help in retaining potentially damaging flows. There is a large

[862] 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

variety of SUDS promoting infiltration, evaporation and other stormwater treatments (e.g., water butts, site layout and management, pervious pavements, filter drains, swales, filter strips, ponds, wetlands, soakways, infiltration trenches and basins, green roofs, bioretention areas and stormwater pre-treatment devices, such as sand filters or silt removal devices[863]) and other innovative systems and combinations might be further implemented. 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

SUDS fulfil the following criteria to either lead to a retention of rain water in a defined area and/or to an improvement in its quality:

- The construction and operation of SUDS is integrated in the urban drainage and wastewater treatment system, where relevant. 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. This implies the fulfilment of Water Framework Directive (2000/60/EC), the Ground Water Directive (2006/118/EC) and the Floods Directive (2007/60/EC).
- 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 rainwater is not directly drained but retained within the area site.
    - The estimated annual percentage of rainwater that is retained in a defined area.
    - The percentage of removed urban runoff pollutants (e.g., oil, heavy metals, microplastics).

[863] As defined in the document JRC Publications Repository - Best Environmental Management Practice for the Public Administration Sector (europa.eu)

- The percentage of runoff reduction peak flow for the related legal reference rainfall event according to the national/ local legislation.

Do no significant harm ('DNSH')

(1) Climate change mitigation	N/A
(2) Climate change adaptation	DNSH as set out in Appendix 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	Depending on the origin of the received water and therefore the different pollutant load (e.g., of rainwater, rainwater run-offs from roofs, rainwater run-offs from motorways, stormwater), SUDS treat these waters before discharging/infiltrating the water into other environmental media. In any case, SUDS 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.
(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appendix D of Annex I to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852. SUDS comply with the Invasive Alien Species Regulation (Regulation (EU) No 1143/2014), the Marine Strategy Framework Directive (Regulation (EU) No 2008/56/EG) 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 *Best Environmental Management Practice for the Public Administration Sector. 2019*"[864] (*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.

[864] As defined in the document JRC Publications Repository: 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.

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 to mitigation is identified.

- DNSH Adaptation: The criteria rely on the ones identified in the first delegated act.

- DNSH Circular Economy: The activity may be 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: SUDS are supposed to improve the water quality. SUDS have such a variety of systems (with different purposes, such as retention or storage) that in terms of pollution it is impossible to define criteria general for all the different facilities. 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. In addition, it is imperative that SUDS are compliant to the applicable EU legislation.

- DNSH to Biodiversity: In many cases SUDS do provide a substantial contribution to the protection and restoration of biodiversity and ecosystems. However, the DNSH criteria rely on the ones identified in the first delegated act. In addition, the criterion includes a specific mention to the local legislation, to the Invasive Alien Species Regulation and the Marine Strategy Framework Directive, in order to avoid this issue in case that nature-based solutions are implemented.

11. Waste management

11.1 Collection and transport of non-hazardous and hazardous waste as a means for material recovery

Description of the activity

This activity covers the separate collection and transport of non-hazardous and hazardous waste in single or comingled fractions aimed at preparing for reuse or recycling, including the construction, operation and upgrade of facilities involved in the collection and transport of such waste (e.g., civic amenity centers and waste transfer stations) as a means for material recovery.

The activity is classified under NACE code E38.11, E38.12 and F42.9 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

Substantial contribution to transition to circular economy

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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[865], iii) biowaste, (iv) wood, (v) glass, (vi) WEEE or (vii) any type of hazardous waste is collected separately (i.e., in single fractions) and not commingled with other waste streams;
3. In the case of source segregated non-hazardous 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:

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[865] This includes textiles, footwear, and accessories (i.e., belts, hats).

- 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 there are other types of economic instruments in place that incentivize waste segregation at source[866]

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.

[866] See European Commission "Guidance for separate collection of municipal waste", section 3.1 (Economic incentives)

Do no significant harm ('DNSH')	
(1) Climate change mitigation	N/A
(2) Climate change adaptation	DNSH as set out in Appendix 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 Appendix B of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.
(5) Pollution prevention and control	The activity utilises waste collection vehicles which conform to at least EURO V standards[867]. • Hazardous waste is collected separately from non-hazardous waste to prevent cross-contamination. Appropriate measures are taken to ensure that, during separate collection and transport, hazardous waste is not mixed either with other categories of hazardous waste or with other waste, substances or materials. Mixing shall include the dilution of hazardous substances; • Proper collection and handling prevent leakage of hazardous waste during collection, transport, storage and delivery to the treatment facility permitted to treat hazardous waste;

[867] Directive 99/96/EC on the approximation of the laws of the Member States relating to measures to be taken against the emission of gaseous and particulate pollutants from compression ignition engines for use in vehicles, and the emission of gaseous pollutants from positive ignition engines fuelled with natural gas or liquefied petroleum gas for use in vehicles and amending Council Directive 88/77/EEC.

	• 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.

11.2 Collection and transport of hazardous waste

Description of the activity

This activity covers the separate collection and transport of hazardous waste prior to treatment, material recovery and/or disposal, including the construction, operation and upgrade of facilities involved in the collection and transport of such waste as a means for pollution prevention and control.

Hazardous waste is waste which displays one or more of the hazardous properties listed in Annex III of EU Directive 2008/98/EC.

It includes (but is not limited to) the following streams (illustrative and non-exhaustive list):

- Hazardous waste fractions produced by households
- Waste oils
- Batteries
- Non-depolluted WEEE
- Non-depolluted end-of-life vehicle
- Medical waste

A comprehensive classification of hazardous waste is found in the European List of Waste (2000/532/EC).The activity is classified under NACE code E38.12 and F42.9 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

Substantial contribution to pollution prevention and control

1. Hazardous waste is source segregated and collected separately from non-hazardous waste to prevent cross-contamination. Appropriate measures are taken to ensure that, during separate collection and transport, hazardous waste is not mixed either with other categories of hazardous waste or with other waste, substances or materials. Mixing shall include the dilution of hazardous substances.
2. Proper collection and handling to prevent leakage of hazardous waste during collection, transport, storage and delivery to the treatment facility, which is permitted to treat hazardous waste, according to national legislation.

3. If a given waste classified as hazardous has also a transport status of dangerous goods under the Agreement concerning the International Carriage of Dangerous Goods by Road (ADR), the transport shall comply with the relevant requirements set by the ADR.

4. The activity utilises waste collection vehicles which conform to at least EURO V standards.[868]

5. During collection and transport, hazardous waste is packaged and labelled in accordance with the international and Community standards in force.

6. 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.

7. 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.

[868] Directive 99/96/EC on the approximation of the laws of the Member States relating to measures to be taken against the emission of gaseous and particulate pollutants from compression ignition engines for use in vehicles, and the emission of gaseous pollutants from positive ignition engines fuelled with natural gas or liquefied petroleum gas for use in vehicles and amending Council Directive 88/77/EEC.

8. The activity delivers the hazardous waste to economic activities which are substantially contributing to either the transition to a circular economy or pollution and prevention control objectives.

Do no significant harm ('DNSH')

(1) Climate change mitigation	N/A
(2) Climate change adaptation	DNSH as set out in Appendix 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 Appendix B of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.
(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*.

3. It is of paramount importance to ensure that during collection and transport hazardous waste is not mixed, either with other categories of hazardous waste or with other waste, substances or materials.
4. In order to ensure a high level of safety, rules set by the Agreement concerning the International Carriage of Dangerous Goods by Road (ADR) shall apply to the transport of hazardous waste when a given waste classified as hazardous has also a transport status of dangerous goods under the ADR.

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.

11.3 Treatment of hazardous waste

11.3.1 Pollution prevention and control

Description of the activity

The activity covers the treatment of hazardous waste as a means for pollution prevention and control. 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 (as per Annex I of the EU Waste Framework Directive) of hazardous waste e.g., landfilling or permanent storage, with the exception of operations D8 (biological treatment), D9 (physico-chemical treatment) and D10 (incineration on land) of the aforementioned Annex, as long as the treatment takes place in installations dedicated (designed, operated and maintained) to the treatment of hazardous waste.
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 to lower the concentration of one (or more) hazardous substances present in the waste, with the aim for the resulting waste mix to be declassified as 'non-hazardous waste' and thus be subsequently treated in facilities non-dedicated to the treatment of hazardous waste. Dilution should not be used as a 'substitute' to the adequate treatment of 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 meet other related criteria) for each single input waste treated at the physico-chemical 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[869] (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.

5) **Applicable to the treatment of water-based liquid waste (complementary to BAT 52 and BAT 53 of WT BREF):**

[869] indirect discharge: discharge not directly to the environment, but to a sewer or to an off-site waste water treatment plant

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[870] elimination of >70% in 7 days (>80% when adapted inoculum is used) in accordance with EN ISO 9888 (Zahn Wellens), or other commonly accepted, equivalent industry standards and methodologies used to assess bio-elimination and related performances.

6) **Applicable to the treatment of POP-containing waste (complementary to BAT 51 of WT BREF, and to BAT 8 of WI BREF in case of thermal treatment):**

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 2017/852 on mercury or a similar one. Based on this tracking system, the installations

[870] DOC: Dissolved Organic Carbon

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 Appendix 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 Appendix 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 po=tentially 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 (as per Annex I of the EU Waste Framework Directive) of hazardous waste e.g., landfilling or permanent storage, with the exception of operations D8 (biological treatment), D9 (physico-chemical treatment) and D10 (incineration on land) of the aforementioned Annex, as long as the treatment takes place in installations dedicated (designed, operated and maintained) to the treatment of hazardous waste:

   The aim is to promote treatment and recovery operations, not disposal.

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)[871].

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.

[871] 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

Further explanation regarding specific TSC:

f) **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 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.

g) **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.

h) **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.

i) 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.

j) 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[872] substances are treated separately in order to minimize the risk posed to receiving water bodies and soil.

k) 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.

l) 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.

[872] Persistent, Bio-accumulative and Toxic

11.3.2 The transition to circular economy

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 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) and on the criteria in Annex III of Directive 2008/98/EC. 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 activities primary aim in terms of revenues generated is the material recovery of secondary raw materials (including chemical substances) from source segregated hazardous waste. The recovered materials are substituting virgin materials or chemicals in production processes.[873] AND The recovered materials fulfil applicable industry specifications, harmonized standards, or end-of-waste criteria as well as relevant legislation.

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 based on the equivalent primary raw material(s). Life-cycle greenhouse gas emissions are calculated using Recommendation 2013/179/EU or, alternatively, using ISO 14067:2018227 or ISO 14064-1:2018228. Quantified life-cycle GHG emissions are verified by an independent third party.
(2) Climate change adaptation	DNSH as set out in Appendix A of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852.

[873] Production processes refer to any kind of economic activity that produces a material, product or asset; recovered materials refer to the output of the recovery process

(3) Sustainable use and protection of water and marine resources	The activity complies with the criteria set out in Appendix B of Annex 1 of the Delegated Acts. 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[874], Regulation (EU) No 2019/1021[875], Regulation (EC) No 1272/2008[876] and Regulation (EC) No 2008/98[877]. Relevant techniques for the activity concerned are deployed as described for pollution prevention and control, as set out in the Best Available Techniques Reference Document (BREF) for Waste Treatment. Activities should comply with the requirements of the 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 EU, L 208, 17.8.2018) (available at https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv%3AOJ.L_.2018.208.01.0038.01.ENG&toc=OJ%3AL%3A2018%3A208%3ATOC).'

[874] 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.

[875] Regulation (EU) 2019/1021 of the European Parliament and of the Council of 20 June 2019 on persistent organic pollutants. Link here.

[876] 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.

[877] Regulation (EC) 2008/98 as amended of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives

(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appendix 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.[878] Nevertheless, several hazardous waste streams can be material recovered and some LCA studies show the broad environmental benefits of these forms of treatment.[879] Therefore, focusing treatment activities 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 to use of primary raw materials if environmental impacts are lower.. Due to the lack of scientific evidence no quantitative material recovery targets were set but could be considered to be added at a later stage. Any recovery of material from hazardous waste can be considered to be a substantial contribution as the standard treatment for this waste stream today still is disposal.

[878] Eurostat "Treatment of waste: by waste category, hazardousness and waste management operations [Env_wastrt]". Link here.

[879] *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.

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 or which can be conidered in future more specific Technical Screening Criteria can be created (e.g., battery recycling). residual waste). 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 outlined 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.

11.4 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 compost 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 bio-waste that is used for anaerobic digestion and/or composting is source segregated and collected separately.

In dedicated anaerobic digestion plants, source segregated bio-waste from separate collection shall constitute a major share of the input feedstock (at least 70%, measured in weight, as an annual average). Co-digestion is eligible only with a minor share (up to 30% of the input feedstock) of advanced bioenergy feedstock listed in Annex IX of Directive (EU) 2018/2001. Anyway, the input shall not include the feedstock excluded as by the letter c) of CMC 3 (Compost) and letter c) of CMC 5 (Digestate other than fresh crop digestate) set in the Annex II of the Regulation (EU) 2019/1009.

The activity produces compost or digestate complying with the Regulation (EU) 2019/1009, in particular Annex II on the Component Material Categories (CMC), referring specifically 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 is used directly for the generation of electricity or heat, or upgraded to bio-methane for use as a fuel or as industry feedstock.

Do no significant harm ('DNSH')	
(1) Climate change mitigation	*DNSH as set out for this activity in Annex 2 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852*
(2) Climate change adaptation	DNSH as set out in Appendix 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 Appendix B of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852
(5) Pollution prevention and control	The activity, when anaerobic digestion plants treating over 100 tonnes per day and for composting plants treating over 75 tonnes per day, must comply with BAT conclusions for waste treatment (Commission implementing decision 2018/1147) or equal or stricter national regulation, 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. Emissions to air and water are lower than the upper end of 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 wastewater generated and to prevent or, where that is not practicable, to reduce emissions to soil and water. BAT 20. In order to reduce emissions to water, BAT is to treat waste water using an appropriate combination of given techniques 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. 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 Appendix 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 allow to improve the soil and replace virgin and critical 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 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 activity is dedicated to treat source segregated bio-waste from separate collection. However, related only to dedicated anaerobic digestion plants, also considering that the bio-waste production isn't steady during the year, it is allowed to input, up to maximum 30%, measured in weight, as an annual average, other streams of advanced bioenergy feedstock listed in Annex IX of Directive (EU) 2018/2001. Anyway, the input shall not include the feedstock excluded as by the letter c) of CMC 3 (Compost) and letter c) of CMC 5 (Digestate other than fresh crop digestate) set in the Annex II of the Regulation (EU) 2019/1009. Moreover, co-digestion of bio-waste with other feedstock is sometime practised to improve the stability of the anaerobic digestion process and increase biogas yields.

The use of compost and digestate, complying with the Regulation (EU) 2019/1009, in particular Annex II on the Component Material Categories, as the majority of the feedstock is always bio-waste, 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.

11.5 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 E39 covering the remediation of environmental damage caused by improper waste management.
- NACE Code E38.2 covering the treatment and disposal of waste, both non-hazardous (38.21) and hazardous (38.22),
- NACE Code E38.32 covering the recovery of materials from waste
- NACE Code F42.9 covering the construction of other civil engineering projects.

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 may include any of the following remediation strategies and subactivities typically implemented as part of projects aimed at removing, controlling, containing and/or diminishing

polluting emissions[880] from non-conforming landfills and abandoned or illegal dumpsites (the definition of the remediation project and its specific subactivities being the result of a feasibility, options and risk assessment as specified in the technical screening criteria for substantial contribution indicated further below):

1) Remediation through environmental isolation of non-conforming/illegal landfills or dumpsites at the present site, including the following:
    - Physical isolation, concentration, structural stabilization and protection of the non-conforming/illegal landfill or dumpsite, including application of hydraulic barriers, sealing, drainage and cover layers;
    - Installation, operation and maintenance of drainage and separate collection and treatment systems for leachates and run-off water prior to discharge;
    - Installation, operation and maintenance of landfill gas collection, abatement and control systems, including wells, piping and flaring systems;
    - Application of top soil and vegetation cover for renaturation purposes.
2) Remediation through excavation and removal of non-conforming/illegal landfills or dumpsites with subsequent treatment, recovery and/or disposal of excavated waste, including the following:
    - Selective excavation of the waste deposited on the site, loading and transport to existing permitted treatment, recovery and/or disposal facilities with separate management of non-hazardous and hazardous waste;
    - Sorting and recovery of materials and fuels from excavated non-hazardous waste, including the installation, operation and maintenance of dedicated facilities and equipment for the duration of the remediation project.
3) Remediation through decontamination of soils, surface and groundwater at the place of pollution, including the following:
    - Selective excavation, loading, transport, temporary storage, backfilling of soil, with separate management of non-contaminated and contaminated soils;
    - Treatment of contaminated soil and/or water, either in situ or ex situ, using e.g., mechanical, chemical or biological methods including the Installation, operation

[880] ´Emission´ means the release in the environment, as a result of human activities, of substances, preparations, organisms or micro-organisms (art. 2, Directive 2004/35/CE)

and maintenance of dedicated facilities for the duration of the remediation project;

- Application of hydraulic barriers, active and passive barriers intended to limit/prevent migration of pollutants.

In addition, the activity also includes all the following sub-activities that are required to prepare, plan, monitor and follow-up the above remediation measures:

- Preparatory investigations including data collection and surveying activities (e.g., geological, hydrological, etc.), technical feasibility and environmental impact studies required to define the remediation project;
- Site preparation including earth moving and levelling works, construction or reinforcement of perimeter walls or fences, primary access and internal roads, demolition of buildings or other structures on the landfill site, etc;
- Monitoring and control of the remediation measures including;
  - Sampling of soil, water, sediment, biota or other materials;
  - Laboratory analysis of samples to identify the nature and concentration of pollutants;
  - Installation, operation and maintenance of monitoring facilities and equipment such as obsevation wells in and outside the perimeter of the landfill site;
- Implementation of other environmental protection and pollution prevention and control measures to comply with the conditions imposed in the environmental permit for the remediation project including measures for safeguarding safety of operations on-site and health of workers (such as for fire control, flood protection, hazardous waste management, etc.);

For the sake of clarity, the following activities are NOT included in the scope of the remediation activity[881]:

- The permanent closure, rehabilitation and after care of existing or new landfills that are compliant with the EU Landfill Directive (1999/31/EC as amended), equivalent national legislation or otherwise aligned with recognized international industry standards[882];

[881] See justification of exclusions in the section on rationale

[882] At the international level, landfill operational guidelines are published by the International Solid Waste Asopciation (ISWA)

- Landfill gas transformation for utilization as energy carrier or industry feedstock;
- Redevelopment of the remediated site for other economic use (e.g., as recreational, residential or commercial areas, installation of PV panels, etc.).
- Compensatory measures for pollution caused by the landfill or dumpsite (e.g., the development and operation of alternative water supply systems for affected population living in the surrounding area, etc)

Substantial contribution to pollution prevention and control

The activity cumulatively fulfills all the following criteria:

1. The remediation activity is not undertaken by the operator[883] that caused the pollution or anyone on its behalf in order 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. Relevant contaminants are removed, controlled, contained and/or diminished using mechanical, chemical, biological or other methods so that the landfill and 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 pose any significant risk of adversely affecting human health and the environment, 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[884].

[883] 'Operator' means any natural or legal private or public person who operates or controls the occupational activity or, where this is provided for in national legislation, to whom decisive economic power over the technical functioning of such an activity has been delegated, including the holder of a permit or authorisation for such an activity or the person registering or notifying such an activity (art. 2, Directive 2004/35/CE)

[884] Directive 2004/35/CE on environmental liability with regard to the prevention and remedying of environmental damage, Annex II, point 2. For remediation activities outside the EU, unless in cases equal or more stringent standards are mandatory under national legislation, reference is made to the UNEP Guidance on the management of contaminated sites.

3. The remediation activity is prepared and conducted in line with best industry practice and including all of the following elements:

   a) The non-conforming/illegal landfill or dumpsite to be remediated has been closed and is not taking in further waste other than possibly inert or biostabilized waste to be used as landfill cover material (as far as allowed in the environmental permit for the remediation project);

   b) Preparatory investigations including site-specific surveys and physical, chemical and/or microbiological data collection are carried out in line with best industry practice and best available techniques to establish (i) the exact location, characteristics and extension of the landfill and the polluted area, (ii) underlying geological and hydrological conditions, (iii) the likely quantity, composition and sources of the landfilled waste, (iv) soil and water pollution originating from it as well as the risks to human health and the environment. The results of such remedial investigations are inputs for a feasibility study that defines the objectives, targets and scope for the remediation and evaluates alternative 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, equivalent national law or commonly accepted international standards[885], and described in a feasibility study produced for the landfill remediation project that convincingly demonstrates how the selected remedial option is the overall best solution to meet the defined remediation objectives and targets.

   d) The landfill remediation project including accompanying monitoring and control plan are approved by the competent authority and consulted with local stakeholders in accordance with national legal requirements,

[885] Directive 2004/35/CE on environmental liability with regard to the prevention and remedying of environmental damage, Annex II, point 1.3.1. For remediation activities outside the EU, reference is made to the UNEP Guidance on the management of contaminated sites (also mentioned in the previous footnote) and the standards and guidance documents for landfill managament published by the International Solid Waste Association, including International Guidelines for Landfill Evaluation (2011), Roadmap for Closing Waste Dumpsites (2016) and Landfill Operational Guidelines (2014, 2019).

e) All materials and fuels recovered from landfilled waste meet relevant quality standards and/or user specifications for the intended recovery operations and do not represent a risk for the environment or human health,

f) Any hazardous waste extracted or otherwise produced by the remediation activity is subject to appropriate collection, transport, treatment, recovery and/or disposal by an authorized operator, in accordance with national legal requirements,

g) Soil and groundwater remediation methods based exclusively on reducing pollutant concentrations through dilution or watering down are not considered acceptable.

h) A control and monitoring plan is implemented, including measures to control the impacts of the remediation activities and to verify the achievement of the remediation objectives and targets, for at least 10 years in case of excavation and removal of the landfill/dumpsite and 30 years in case of environmental isolation of the landfill/dumpsite unless a different duration sufficient to guarantee long-term risk control is defined in national legislation or by the competent regulatory authority for the specific remediation project.

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), equivalent national law or commonly accepted international industry standards.[886]
(2) Climate change adaptation	DNSH as set out in Appendix A of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852

[886] See references included in previous footnotes on EU and international industry standfards for landfill operations including landfill gas abatement and control systems

(3) Sustainable use and protection of water and marine resources	DNSH as set out in Appendix 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[887] 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.
(4) Transition to circular economy	Where the remediation project foresees the excavation and removal of the existing landfill or dumpsite, the excavated waste is managed in accordance with the waste hierarchy principle, prioritizing material recovery over incineration and disposal, to the extent this is technically feasible and does not increase risks for the environmental or human health.

[887] See references included in previous footnotes on EU and international industry standards for landfill operations including pollution abatement and control systems

(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appendix 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.

Concerning the recovery of recyclable materials and production of fuels from landfilled waste: Landfill mining is a combined strategy for remediating environmental impacts associated to landfills and simultaneously recovering new land for further redevelopment and also materials for recycling (or backfilling) and energy carriers (fuels) for energy production. It is an emerging and intensely researched area of activity with various pilot and demonstration projects carried out in a number of EU Member States with support from EU and national public funds[888]. At present, there is no dedicated regulatory framework nor commonly accepted technical standards for landfill mining. Although landfill mining has the potential to generate additional financial cashflows through the recovery of land, materials and/or energy and hence reduce the overall cost of remediation, the excavation and treatment of waste that has been deposited for many years or even decades and whose exact composition is often unknown, has many

[888] See for instance landfill mining (ELFM) projects featured on the website of the EU funded EURELCO network (European Enhanced Landfill Mining Consortium)

technical and environmental risks. Hence, landfill mining should only be considered as a solution for the remediation of old landfills and dumpsited where it is able to convincingly demonstrate that it delivers the best overall environmental outcome and tthat he risks involved are properly and transparently assessed and managed prior to and during the remediation works.

The rationale for exclusion of the following activities from the scope or the landfill remediation activity is provided below.

Remediation activities falling under EU Directive on environmental liability (2004/35/CE) are excluded as they constitute a legal requirement for the operator that caused the pollution in accordance with the polliuter-pays-principle.

Similarly, the permanent closure, rehabilitation and after care of landfills that are compliant with the EU Landfill Directive, equivalent national legislation or otherwise aligned with commonly accepted international industry standards is NOT considered a substantial contribution to pollution prevention and control as in such cases the pollution abatement and control systems and procedures put in place to prevent environmental pollution and health hazards are legally mandatory.

Concerning the exclusion of landfill gas utilization (e.g., for energy production or conversion to biomethane for further use as fuel or chemical feedstock): as indicated in the description of the remediation activity the installation and operation of landfill gas management and control systems (including capture and flaring systems) are condidered an integral part of the landfill remediation activity substantially contributing to pollution prevention and control as it reduces the risk of landfill fires (which release toxic substances to the environment through the uncontrolled combustion of waste). On the contrary, the utilization of collected landfill gas is not a remediation measure per se but a complementary energy recovery activity, hence its exclusion from the scope. The capture and untilization of landfill gas is considered a sustainable activity with substantial contribution to climate change mitigation where it meets the technical screening criteria mentioned in section 6.5 of the Delegated Act on sustainable activities for the climate related change adaptation and mitigation objectives.

Concerning the exclusion of activities for the redevelopment of remediated landfill sites: landfill remediation projects may include as an objective the redevelopment of the remediated landfill or the remediated land after the removal of the landfill for other economic uses. This may be considered in particular in cases where land is a scarce resource. While the remediation

activity must always take into account the future use of the land, the subsequent redevelopment and construction activity is subject to specific technical screening criteria for substantial contribution to environmental objectives under the EU taxonomy. Hence its exclusion from the scope of the remediation activity.

Concerning the exclusion of compensatory measures in relation to the pollution caused by the landfill or dumpsite: particularly in cases where the landfill or dumpsite site to be remediated is located in close vicinity to residential areas, and the pollution caused cannot be entirely eliminated (e.g., to soils and groundwater), compensatory measures may be needed to prevent risks to human health. Such measures, which may include the development and operation of alternative waste supply systems are subject to specific technical screening criteria for substantial contribution to environmental objectives under the EU taxonomy. Hence their exclusion from the scope of the remediation activity.

11.6 Depollution and dismantling of end-of-life products

Description of the activity

This activity covers the construction, operation and upgrade of facilities dismantling and depolluting complex end-of-life products, movable assets and their components 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);
- E38.32 (which includes the recovery of sorted materials);
- 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 end-of-life products and movable assets and their components of any type (e.g., automobiles, ships, computers, televisions, components from wind turbines, 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 treatment of batteries stemming from separate collection or removed during dismantling and depollution activities, and the dismantling & deconstruction of civil engineering buildings.

Substantial contribution to transition to circular economy

The economic activity dismantles and depollutes separately collected waste, in state-of-the-art facilities, from complex end-of-life products, such as automobiles, electronic and electrical appliances (EEE) or ships, to:

- Harvest parts and components that are suited for re-use;
- Separate non-hazardous and hazardous waste fractions suited for material recovery;
- Remove hazardous substances, mixtures and components contained in an identifiable stream or are an identifiable part of a stream within the treatment process that is sent to facilities permitted for proper treatment and disposal of hazardous waste.

For the dismantling and depollution of ship wrecks, the facility is included in the European List of ship recycling facilities provided by the Commission implementing decisions (EU) 2016/2323. In the case of construction or upgrade of an existing facility which is not yet included in the European List of ship recycling facilities, the facility fulfils all requirements and applies to be included in the European List of ship recycling facilities.

For the dismantling and depollution of Waste from Electrical and Electronic Equipment (WEEE) and End-of-Life vehicles (ELVs), waste originates from collection points meeting the applicable requirements set by European[889] and national legislation.

Do no significant harm ('DNSH')

[889] At EU level, applicable requirements are set for WEEE by the Directive 2012/19/EU and for ELVs by Directive 2000/53/EC applicable to ELVs

(1) Climate change mitigation	N/A
(2) Climate change adaptation	DNSH as set out in Appendix 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 Appendix 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 and 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.[890]

Ship recycling

The facility complies with the substantive requirements set out in Article 13 of Regulation (EU) No 1257/2013 and is included in the European List of ship recycling facilities established under that Regulation. In addition, the facility shall also comply with the requirements set out in Article 7 of that Regulation with regards to the preparation of a ship-specific recycling plan prior to any recycling of a ship.

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

[890] 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 Appendix 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.

11.7 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)

The sorting and material recovery of mixed residual waste, such as in mechanical and biological treatment plants, is excluded from the scope of this activity.

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, including in comingled fractions;[891]
- 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 applicable 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 Best Available Techniques (BAT) based on BAT 2 of the Reference Document (BREF) for Waste Treatment on improving overall environmental performance of the plant including:

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,

[891] 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.

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

v) The relevant measures to ensure waste compatibility prior to mixing or blending of waste;

vi) The facility has installed the sorting and material recovery technology and processes to meet relevant technical specifications, quality standards or end-of-waste criteria. The activity uses state-of-the-art technologies suited to the waste fractions processed including, for instance, optical separation by near-infrared spectroscopy or X-ray systems, density separation, magnetic separation or size separation. ***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 Appendix 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 Appendix B of Annex 1 to the Commission Delegated Regulation (EU) …/…supplementing Regulation (EU) 2020/852. For activities falling under the scope of the Best Available Techniques (BAT) Reference Document for Waste Treatment (WT BREF), the activity implements the relevant techniques for the protection of water and marine resources and meets the relevant associated emission limits (BAT-AELs).
(5) Pollution prevention and control	For activities falling under the scope of the Best Available Techniques (BAT) Reference Document for Waste Treatment (WT BREF), the activity implements the relevant techniques for pollution and prevention control and meets the relevant associated emission limits (BAT-AELs).

(6) Protection and restoration of biodiversity and ecosystems	DNSH as set out in Appendix 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,[892] 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[893] 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.

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,

[892] 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.*

- 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.