7 The European Union sustainable finance taxonomy

The EU taxonomy regulation was published in June 2020. It defines sustainable economic activities as those providing a substantial contribution to one of six environmental objectives: climate change mitigation, adaptation, protection of water, ecosystems, circular economy and tackling pollution. At the same time, such substantial contribution on one objective must go with not significantly harming any other objective. The EU taxonomy regulation will be an essential reference in a number of other forthcoming sustainable finance regulations in the EU, such as those addressing disclosures or the EU green bond standard. The EU Technical Expert Group has proposed Technical Screening Criteria to the Commission; those will be considered for inclusion in a forthcoming legislation by the end of 2020.

7.1. History and present status of EU taxonomy

7.1.1. Introduction

In March 2018, the European Commission (EC) put forward a draft "Regulation on the establishment of a framework to facilitate sustainable investment" (EuropeanCommission, 2018[1]). This regulation set out a framework for designing a taxonomy of environmentally sustainable economic activities. In doing so, the EC followed the recommendation of the High Level Expert Group on Sustainable Finance (HLEG), an expert group established by the EC in December 2016. The HLEG had a mandate to develop a comprehensive European strategy on green finance . In June 2018, the EC appointed a Technical Expert Group (the TEG) to, among other things, help it design the technical screening criteria for the taxonomy. The OECD was an observer to the TEG. In parallel, a Member States Expert Group was also established. These groups initiated discussions, both at state level and in financial markets, on whether it was appropriate to legislate on a taxonomy, and if so how [the taxonomy should be designed. The outcome of these discussions was the adoption of the taxonomy regulation by EU co-legislators (European Commission, European Parliament and Council of Europe) in December 2019. The EC also launched an International Platform on Sustainable Finance (IPSF) in September 2019 as a way to facilitate the exchange of views on best practices, promote international cooperation and, when appropriate, coordination in the area of environmentally sustainable finance.

7.1.2. The High Level Expert Group on Sustainable Finance

As part of its effort to tackle the climate challenge, the European Commission signalled its intention to spur the development of sustainable finance, as part of the completion of the Capital Markets Union led by DG FISMA. Appointed in 2016, the EU High Level Expert Group (HLEG) on Sustainable Finance recommended ten priority actions to the Commission. The first point was to develop "a common sustainable finance taxonomy to ensure market consistency and clarity, starting with climate change." The final report of the HLEG report stated that "if Europe is to mobilise capital at scale for sustainable development, it needs a technically robust classification system to establish market clarity on what is 'green' or 'sustainable'. Introducing a sustainability taxonomy will enhance market efficiency and help to channel capital flows towards assets that contribute to sustainable development" (HLEG, 2018[1]). In March 2018, against the backdrop of the HLEG's recommendations, the EC published its Action Plan on Financing Sustainable Growth. In May, a legislative proposal on the establishment of a taxonomy for environmentally sustainable economic activities ensued. The EC nominated a Technical Expert Group (TEG) to assist in the development of that legislative proposal, with the OECD as an observer.

7.1.3. Role of the TEG

The TEG is a group of 35 members mostly from the financial industry, asset management firms, development banks, trade associations and NGOs. The European Bank for Reconstruction and Development (EBRD), the Central Bank Network for Greening the Financial System (NGFS), the United Nations Environment Programme Finance Initiative (UNEP FI) and OECD are observers. The group's initial term was one year and was subsequently extended to September 2020. The group met physically in Brussels for an average of two days per month. The TEG was divided into four sub-groups, with three corresponding to each of three regulations (taxonomy, benchmarks for the asset management industry, climate related disclosures), and a fourth tasked with making recommendations on a possible future standard for EU-labelled Green Bonds. Regarding the Taxonomy Regulation, the TEG's role has been to assist the Commission in preparing the Delegated Acts for the draft regulation issued by the Commission in March 2018. The Delegated Acts will contain the details for implementing the regulation, called Technical Screening Criteria. The regulation will enter into force as the Delegated Acts and associated Technical Screening Criteria are issued in stages between 2022 and 2023. The TEG consulted extensively with the

public and a wide range of experts during its mandate. In March 2020, the TEG issued its final summary report on the Taxonomy Regulation, a technical annex and an excel tool.

7.1.4. Next legislative steps

European co-legislators adopted the Taxonomy Regulation (henceforth "the Regulation") on December 18, 2019. The Regulation was published at the Official Journal of the European Union on June 20, 2020 (EUOFFICIALJOURNAL, 2020[2]). The Regulation establishes a step-by step process, where Technical Screening Criteria are adopted in two batches of Delegated Acts. The first batch concerns climate change adaptation and mitigation (see below for a description of environmental objectives in the Regulation). They must be adopted by 31 December 2020, for entry into application on 31 December 2021. The second batch concerns the four other environmental objectives established in the Regulation (water, waste, pollution and ecosystems). They must be adopted one year later, i.e. by 31 December 2021 for entry into application on 31 December 2022.

The May 2018 legislative proposal "establishes the criteria for determining whether an economic activity is environmentally sustainable"[1]. Therefore, the Regulation does not deal with financial products. The EC is currently working on a legislative proposal for an EU Ecolabel for retail financial products. The EU Ecolabel is expected to make reference to the Taxonomy. The TEG also issued a Usability Guide for the EU Green Bond Standard at the same time as the final Taxonomy report. The EU Green Bond Standard (EU GBS) is a TEG recommendation to the EC for an EU label for Green Bonds. The draft model of the EU GBS in the TEG's final report would link use-of-proceeds of EU Green Bonds to the EU Taxonomy Regulation. It also calls for mandatory verification by accredited verifiers.

To sum up, the EU taxonomy as available now is an existing regulation, but is not yet implemented nor fully developed. Besides, it sets a framework to define environmentally sustainable economic activities, but does not apply directly to financial products.

7.2. Objectives and scope of the EU Taxonomy

7.2.1. Objectives

The EU Taxonomy's objectives are linked to those of the EC Action Plan on Financing Sustainable Growth, published in March 2018:

- Reorient capital flows towards sustainable investment, in order to achieve sustainable and inclusive growth,
- Manage financial risks stemming from climate change, environmental degradation and social issues,
- Foster transparency and long-termism in financial and economic activity.

The EU Taxonomy aims at being a classification system that provides a common language on what constitutes a sustainable activity, i.e. the criteria an economic activity must meet to qualify as contributing to EU sustainability objectives. Establishing the classification system can help achieve goals such as fostering transparency and reorienting cash flows toward sustainable investment. At the time, , there was no such classification system at EU level (there is one now), and existing market-based practices are not necessarily aligned with EU environmental and sustainability policy objectives. Furthermore, national standards and financial product labels within the EU differ, which might be warranted on some grounds, but also might in some cases confuse investors, including retail investors. Differences between national standards and labels in some cases also could hamper cross-border sustainable investments. Incoherence between classification systems or the absence of classification system in some jurisdictions might also create the risk of greenwashing, which could undermine investors' confidence.

7.2.2. Scope/ Activities

The EU legislators aimed at a definition of sustainability that goes beyond climate objectives, and encompasses social and governance aspects. The six environmental objectives identified for the EU Taxonomy are:

1. Climate change mitigation
2. Climate change adaptation
3. Sustainable use and protection of water and marine resources
4. Transition to a circular economy
5. Pollution prevention and control
6. Protection and restoration of biodiversity and ecosystems

For an economic activity to be considered Taxonomy-eligible, it must:

1. Contribute substantially to one or more of the environmental objectives
2. Do no significant harm to any of the other environmental objectives
3. Comply with minimum social and governance safeguards. Under the Regulation, these are defined as in alignment with the OECD Guidelines for Multinational Enterprises and UN Guiding Principles on Business and Human Rights, including the International Labour Organisation's ('ILO') declaration on Fundamental Rights and Principles at Work, the eight ILO core conventions and the International Bill of Human Rights.

With this definition, economic activities, even when making a substantial contribution to climate change mitigation and/or adaptation, will not be eligible if they cannot be performed in a way that avoids significant harm to other environmental objectives.

7.2.3. Scope/Geography

The "Do no significant harm" criteria recommended by the TEG are often based on existing European environmental law. An example for such criterion would be the acceptable threshold for water contamination for a manufacturing plant, which is found in EU legislation. Therefore, the TEG-recommended criteria are not directly applicable to economic activities located outside the EU. At the same time, many potential users of the EU taxonomy have portfolios with worldwide economic activities. The TEG addressed this issue by pointing to the Technical Screening Criteria that the group considered to be of global relevance. The criteria were flagged as such in the TEG report (p 54) : "*It is the view of the TEG that this criterion is globally relevant. The performance level in the criterion is designed to be consistent with a net zero by 2050 goal. The performance level is not tied specifically to EU regulations, though cross-reference is made where appropriate to those regulations to assist EU users."*

The TEG recognises that locally relevant standards may reasonably be applied in countries outside the EU. In cases where a locally relevant threshold has been used to assess the environmental performance of an economic activity, the TEG invites companies and investors to provide additional details setting out the rationale for variation from the TEG standard. Those additional details, however, would not make the activity EU Taxonomy-aligned (unless the criteria are equivalent to or more ambitious than the EU threshold).

The TEG also proposed some principles for design of taxonomies by individual countries, in order to foster international taxonomy harmonisation. Taxonomies should specify specific environmental goals. They should cover a list of economic activities, using a classification system. They should use performance metrics, and performance thresholds for each economic activity.

Two bodies will focus on advancing the issue of international applicability and coordination of the EU taxonomy. The first of these two bodies is the International Platform on Sustainable Finance set up by the EC in September 2019. The second is the future Platform on Sustainable Finance set out in the Regulation, to be established in September 2020 to succeed the TEG.

7.2.4. Scope/ Sector approach/Use of NACE codes

The TEG decided to use the NACE[2] industrial classification system of economic activities in order to define the EU taxonomy technical screening criteria. While NACE code frameworks are consistent with the vast majority of economic data produced today at EU level[3], and reconcilable with EU national economic and statistical frameworks, there are consequences to using such frameworks. A NACE codes- based taxonomy is not obviously reconcilable with other classification systems widely used by private financial markets participants to analyse their data, such as the GICS (Global Industrial Classification System). Other issues may appear when NACE codes and the notion of "economic activity" are applied for practical purposes. A bond issued by a construction company will be recorded under certain reporting frameworks under the NACE code "construction" of the holding company. However, this bond may be a green bond with use of proceeds for building a solar farm. Furthermore, large corporates often issue their bonds at the level of a holding company recorded under the "finance" NACE code, which is not covered by the presently available version of the EU taxonomy[4]. A consequence could be that the use of NACE codes may not capture all economic activities that are potentially environmentally sustainable. This issue and possible solutions will materialise at the time of implementation of the Regulation.

Another potential issue could be the adequacy of the NACE classification system in the context of mapping of investments to determine Paris Agreement compatibility. The NACE reporting framework is fully consistent with GDP accounting and so suffers the same shortcomings as GDP in its capacity to capture environmental sustainability. These flaws are well documented (Stiglitz, Fitoussi and Durand, 2018[3]). In addition, some new transition activities or sectors such as Carbon Capture and Storage do not exist in NACE. For the purposes of the TEG report, some additions have been made in the report to the existing NACE framework. For example, buildings do not have their own specific NACE code. Natural capital preservation, restoration and creation and related services also do not have NACE codes for the time being. NACE codes were supplemented by additional codes CEPA (Classification of Environmental Protection Activities) (European Commission, 2020[4])and CREMA (Classification of Resource Management Activities) (European Commission, 2020[5]) because of these gaps.

Furthermore, an economic activity cannot be considered sustainable independent of the wider system in which it operates – one of the key themes in OECD work on "accelerating climate action" (OECD, 2019[6]). Critical systems examples are the energy, transport, urban, water and food systems. For example, the environmental sustainability of emissions reductions enabled by an electric vehicle depends on a number of factors, e.g. the carbon-intensity of the electricity used to charge the battery, the extent to which the vehicle adds to traffic congestion, whether there is reuse or recycling at the end of battery life. In order to substantially contribute to environmental objectives, the critical aspects of a system -- i.e. resources used, transformation processes and infrastructure underpinning the system -- must be decarbonised and made resilient. In addition, the nature of the transition in each country or region will be influenced by the evolution of the entire system, including local strategies and policies. A Taxonomy-eligible activity may only contribute to an individual country or region's transition pathway when it is also coherent with the transition of the overall system of which the activity is a part. Wherever possible, the EU Taxonomy criteria have attempted to take a systems approach into account. However, this is necessarily limited in an activity-based approach.

7.2.5. Principles

The following principles have guided the development of the draft EU taxonomy:

- Technology neutrality: The selected criteria must not discriminate between technologies, provided they have the same impact on environmental objectives.
- Dynamic and evolving tool: The dynamic character of the transition and the uncertainty related to technology result in a need to update the thresholds, which in some cases are set to decline over time to be consistent with a chosen transition pathway. The EC Platform set up to succeed the TEG in 2020 will be tasked with reviewing and adjusting the criteria as appropriate.
- Easy to understand and use: The purpose of the taxonomy is to be understood and used by financial market participants, so it must be user-friendly, and not too costly for users in terms of expenditures and time.
- Enabling transition activities, versus a "binary" "green or not" approach. The taxonomy scopes three kinds of economic activities:
  - Activities that are already low carbon: i.e. with very low, zero or net negative emissions, and compatible with a net zero CO2 economy by 2050. Examples include renewable energy, zero emissions transport, and afforestation.
  - Activities that contribute to the transition to a net zero economy in 2050. The list of those activities may need to be revised regularly and tightened over time. Examples include building renovation, electricity generation up to 100 gr CO2/kWh, or cars generating less than 50 gr CO2/km.
  - Activities that enable emissions reductions in the first two types of activities above. They are for instance manufacture of wind turbines, or the installation of efficient boilers in building, provided certain criteria are met.

Additional details on these activities are provided below.

7.3. Metrics and thresholds

The Annex to this report provides an overview of the proposed criteria for substantial contribution to economic activities that mitigate climate. As stated above, each of those criteria goes with other criteria for "do no significant harm" (DNSH) to climate adaptation and four other environmental objectives posed in the regulation. For the sake of brevity, this overview does not provide details on the DNSH criteria.

7.4. Outlook and next steps

7.4.1. Coverage of the taxonomy and extension to more economic activities

The EU Taxonomy aims to have extensive coverage, with 72 economic activities included. Those activities were prioritised according to their contribution to total GHG emissions in the EU in 2017.

Table 7.1. GHG emissions for sectors considered in the TEG taxonomy, EU-28, 2017

NACE macro-sector	GHG (Tonne)	Share of GHG (% of GHG from all NACE Macro-sectors)
A- Agriculture, forestry and fishing	520,860,082.54	14.7%
B – Mining and quarrying	79,624,366.67	2.3%
C- Manufacturing	846,420,845.95	23.9%
D- Electricity, gas, steam and hair conditioning supply	1,072,529,498.49	30.3%
E – Water supply, sewerage, waste management and remediation	163,285,205.41	4.6%
F – Construction	60,058,074.32	1.7%
H- Transportation and storage	535,602,112.51	15.2%
J- Information an communication	10,396,008.51	0.3%
L- Real estate activities	6,246,240.47	0.2%
Total A-F, H, J, L	3,295,022,434.87	93.2%

More activities may be added to the taxonomy in the future as implementation starts. Within the sectors already covered, some of the TEG recommendations for activities to be added in the future have been described in Section 3 of this annex.

7.5. Future steps mentioned in the taxonomy regulation

The EC will review the taxonomy regulation two years after its entry into force, and then every three years. A "brown taxonomy" could be proposed by the end of 2021, as well as criteria related to social aspects. In its revision of the Taxonomy Regulation, the EC will consider possible effects of the Taxonomy Regulation on stranded assets, costs and benefits of implementation, and impact in terms of increasing sustainable finance flows.

7.5.1. Use of the Taxonomy Regulation

Financial products subject to the NFRD regulation (see below) will need to use the taxonomy when they claim to have an environmentally sustainable investment objective (i.e. financial products referred to under Article 9 in the NFRD). They will need to disclose how and to what extent the taxonomy was used. They will also need to disclose the taxonomy-compliant share of their investment. The same requirements apply to products claiming to have ESG characteristics (referred to under Article 8 of the NFRD). Large corporates subject to the NFRD will need to disclose the taxonomy-compliant share of their turnover, capital expenditures (capex) and operating expenses (opex).

The financial products in scope are:

- Asset Management: UCITS[5] Funds (equity, bond, ETFs[6]), Alternative Investment Funds[7], Portfolio Management.
- Insurance: Insurance Based Insurance Products (IBIPs).

7.5.2. Next steps

Regarding the Taxonomy Regulation

The Regulation must be approved formally by an EU Parliament Plenary session during 2020. Delegated Acts must be approved by the end of 2021 for Technical Screening Criteria (TSC) relating to substantial contribution to climate change mitigation and adaptation. TSC relating to substantial contribution on the

four other environmental objectives (waste, waste, pollution and ecosystems) will need to be approved by end 2022.

Regarding other European regulations referencing the Taxonomy Regulation

The EC signalled its intention to put forward a legislative proposal for a EU Green Bond Standard in 2020. In order to be eligible to the Standard, the use of proceeds of green bonds will need to be aligned with the EU Taxonomy. There would be mandatory verification by accredited verifiers.

Annex 7.A. Overview of the proposed criteria of the EU Taxonomy

The thresholds and language in this section derive mainly from the final technical report of the TEG, to which readers may refer for the full details. To be more precise, this section attempts to summarise in a condensed way pages 30 to 578 of the Technical Annex to the TEG Final Report on the EU Taxonomy. The focus is on thresholds and metrics, rather than principles or rationales, given the scope of the present report.

Forestry

The following economic activities are addressed in the Taxonomy: afforestation, reforestation, restoration, rehabilitation, forest management and conservation forest. There are some differences and nuances in the metrics and thresholds between these sub-categories. A broad, indicative summary of them is:

- Continued compliance with Sustainable Forest Management criteria
- Verified GHG balance baseline for above-ground carbon pools
- Above-ground carbon stocks must increase above the baseline

Forestry criteria are considered by the TEG to be of international relevance

Agriculture

In the EU, 10% of GHG emissions are attributed to agriculture. The following economic activities are addressed in the Taxonomy:

- Growing of non-perennial crops (including cereals, rice, vegetables…)
- Growing of perennial crops (including grapes, fruit, beverage crops…)
- Livestock production: including dairy, other cattle, pigs, poultry…

A broad, indicative summary of applicable criteria is:

- Avoid or reduce GHG emissions, including those from inputs used on the farm, through the application of appropriate management practices
- Maintain and increase existing carbon stocks for a period equal to or greater than 20 years through the application of appropriate management practices
- Land was not deemed previously to be “of high carbon stock”, such as peat lands and wetlands.

Manufacturing

The manufacturing section of the Taxonomy includes both the manufacturing of low-carbon technologies as well as energy-intensive and hard-to-abate manufacturing sectors. Specifically, this includes: the manufacturing of aluminium (NACE 24.42); the manufacturing of iron and steel (NACE 24.1, 24.2, 24.3); the manufacturing of cement (NACE 23.51); and the manufacturing of chemicals (NACE 20.13, 20.14, 20.15, 20.16). It aims to give support to those economic activities that are low in carbon emissions and to first movers who are engaging in a transformational shift.

Additionally, the Taxonomy includes manufacturing activities that produce the products and technologies that can contribute to GHG emissions reductions in other sectors of the economy. Specifically, this refers to the manufacturing of products, key components, equipment and machinery that are essential to a number of key renewable energy technologies (geothermal power, hydropower, concentrated solar power (CSP), solar photovoltaic (PV) technology, wind energy and ocean energy); the manufacturing of low-carbon transport vehicles, fleets and vessels; and the manufacturing of energy efficiency equipment for buildings. The TEG was not able to complete work for other manufacturing sectors, including mining, due to time constraints and the complexity of the issues.

The criteria focus on reducing GHG emissions caused by manufacturing activities up to the levels of performance achieved by best performers. The criteria generally cover both Scope 1 and Scope 2 emissions. The EU ETS benchmarks have been the main reference for setting such thresholds, as they correspond to the level of performance achieved by the 10% best installations in the EU and are updated regularly.

There are no explicit thresholds for those manufacturing activities listed under the category “low carbon technologies”. No criteria on the GHG emissions from manufacturing of listed products are specified since the mitigation benefits of these products, components, equipment and technologies are considered to outweigh the emissions generated as a result of the manufacturing process to generate them.

Low Carbon Technologies

This sector includes:

- Manufacture of products, key components and machinery that are essential for eligible renewable energy technologies (associated conversion efficiency requirements are set in the Renewable Energy Directive (2018/2001/EU)).
- Manufacture of low carbon transport vehicles and their respective key components, fleets and vessels meeting specific criteria:
  - For passenger cars, light commercial vehicles (CO_2 Regulation for cars and vans (EU) 2019/631):
    - Until 2025: vehicles with tailpipe emission intensity no greater than 50 g CO_2/km. This also includes vehicles with zero tailpipe emissions (e.g. electric, hydrogen).
    - From 2026 onwards: only vehicles with emission intensity of 0g CO_2/km
  - For category L vehicles (e.g. motorcycles):
    - Zero tailpipe emission vehicles (incl. hydrogen, fuel cell, electric)
  - Heavy-duty vehicles: N2 and N3 vehicles, as defined by the Heavy Duty CO_2 Regulation (EU) 2019/1242):
    - Zero direct emission heavy-duty vehicles that emit less than 1g CO2/kWh (or 1g CO_2 /km for certain N2 vehicles);
    - Low-emission heavy-duty vehicles with specific direct CO_2 emissions of less than 50% of the reference CO_2 emissions of all vehicles in the same sub-group.
  - Rail fleets:
    - Zero direct emission trains
  - Urban, suburban and interurban passenger land transport fleets:
    - Zero direct emission land transport fleets (e.g. light rail transit, metro, tram, trolleybus, bus and rail)
  - Water transport:
    - Zero direct emission waterborne vessels

- Manufacture of the following products for energy efficient equipment for buildings and their key components is eligible:
  - Installation of Building Management Systems (BMS)
  - High efficiency windows (U-value better than 0.7 W/m2K)
  - High efficiency doors (U-value better than 1.2 W/m2K)
  - Insulation products with low thermal conductivity (lambda lower or equal to 0.045 W/mK), external cladding with U-value lower than 0.5 W/m2K and roofing systems with U-value lower than 0.3 W/m2K)
  - Hot water fittings (e.g. taps, showers) that are rated in the top class of the European Water Label Scheme (http://www.europeanwaterlabel.eu/)
  - Household appliances (e.g. washing machines, dishwashers) rated in the top available class according to the EU Energy Label for each type of appliance
  - High efficiency lighting appliances rated in the highest energy efficiency class that is significantly populated in the energy efficiency label (or higher classes) according to EU Energy labels
  - Presence and daylight controls for lighting systems

Cement

Thresholds for cement clinker (A) are applicable to plants that produce clinker only, and do not produce finished cement. All other plants need to meet the thresholds for cement (B) or alternative binder.

(A) Cement clinker

Specific emissions (calculated according to the methodology used for EU-ETS benchmarks) associated with the clinker production processes must be lower than the value of the related EU-ETS benchmark. As of February 2020, the EU-ETS benchmark value for cement clinker manufacturing is: 0.766 tCO_2e/t of clinker[8].

(B) Cement

Specific emissions associated with the clinker and cement production processes are lower than 0.498 of tCO_2e/t cement or alternative binder.

Aluminium

Manufacture of primary aluminium is eligible if Criteria 1 is met in combination with either Criterion 2 or 3 below.

- Criterion 1: Direct emission for primary aluminium production is at or below the value of the related EU-ETS benchmark. As of February 2020, the EU-ETS benchmark value for aluminium manufacturing is 1.514 tCO2e/t. Direct emissions are to be calculated according to the methodology used for EU-ETS benchmarks.
- Criterion 2: Electricity consumption for electrolysis is at or below 15.29 MWh/t (European average emission factor according to International Aluminium Institute, 2017, to be updated annually)
- Criterion 3: Average carbon intensity of the electricity that is used for primary aluminium production (electrolysis) is at or below 100 g CO2e/kWh (Taxonomy threshold for electricity production, subject to periodic update).

Manufacture of secondary aluminium (i.e. production of aluminium from recycled aluminium) is eligible. No additional mitigation criteria need to be met.

Iron and Steel

Manufacturing of iron and steel is eligible if the GHG emissions (calculated according to the methodology used for EU-ETS benchmarks) associated with the production processes are lower than the values of the related EU-ETS benchmarks. As of February 2020, the EU-ETS benchmarks values for iron and steel manufacturing are:

- Hot metal = 1.328 tCO_2e/t product
- Sintered ore = 0.171 tCO_2e/t product
- Iron casting = 0.325 tCO_2e/t product
- Electric Arc Furnace (EAF) high alloy steel = 0.352 tCO_2e/t product
- Electric Arc Furnace (EAF) carbon steel = 0.283 tCO_2e/t product
- Coke (excluding lignite coke) = 0.286 tCO_2e/t product

All new steel production, or combination of new and recycled steel production, is eligible if the emissions fall below the thresholds above. Additionally, all production of steel in an Electric Arc Furnace where at least 90% of the iron content in the final products is sourced from scrap steel is considered eligible. In this case, no other thresholds are applicable.

Manufacture of hydrogen

The following thresholds need to be met:

- Direct CO2 emissions from manufacturing of hydrogen: 5.8 tCO2e/t Hydrogen in alignment with energy thresholds in the taxonomy.
- Electricity use for hydrogen produced by electrolysis is at or lower than 58 MWh/t Hydrogen.
- Average carbon intensity of the electricity produced and used for hydrogen manufacturing is at or below 100 g CO2e/kWh (Taxonomy threshold for electricity production, subject to periodic update).

Other inorganic basic chemicals

Manufacturing of carbon black and soda ash are eligible if the GHG emissions (calculated according to the methodology used for EU-ETS benchmarks) associated with the production processes are lower than the values of the related EU-ETS benchmarks. As of February 2020, the EU-ETS benchmarks values are:

- Carbon black: 1.954 tCO_2e/t
- Soda ash: 0.843 tCO_2e/t

Manufacturing of chlorine is eligible if the two following thresholds are met:

- Electricity use for chlorine manufacturing is at or lower than 2.45 MWh/t chlorine (includes both electrolysis and chlorine treatment, threshold subject to periodic update)
- Average carbon intensity of the electricity that is used for chlorine manufacturing is at or below 100 g CO_2e/kWh (Taxonomy threshold for electricity production, subject to periodic update).

Other organic basic chemicals:

This activity comprises the manufacturing of high value chemicals, aromatics, ethylene chloride, vinyl chloride, ethylbenzene, styrene, ethylene oxide, monoethylene glycol and adipic acid. It also comprises organic chemicals falling under the following Eurostat Classification of Products by Activity (CPA) codes:

- Saturated acyclic monocarboxylic acids and their derivatives (CPA code 20.14.32)

- Unsaturated monocarboxylic, cyclanic, cyclenic or cycloterpenic acyclic polycarboxylic acids and their derivatives (CPA code 20.14.33)
- Aromatic polycarboxylic and carboxylic acids with additional oxygen functions; and their derivatives, except salicylic acid and its salts (CPA code 20.14.34)

For the manufacturing of all chemicals covered in this activity (except the manufacture of the following CPA product categories: 20.14.32, 20.14.33, 20.14.34), the selected metric is GHG emissions per unit of production (tCO_2e/t) (emissions factor). GHG emissions must be calculated according to the methodology used for EU-ETS benchmarks. ETS product benchmarks only for the manufacturing of all chemicals covered in this activity (except the manufacturing of the following CPA product categories: 20.14.32, 20.14.33, 20.14.34):

- For HVC: 0,702 tCO2e/t
- For aromatics: 0,0295 tCO2e/t t216
- For vinyl chloride: 0,204 tCO2e/t
- For styrene: 0,527 tCO2e/t
- For ethylene oxide/ethylene glycols: 0,512 tCO2e/t

Fertilizers and nitrogen compounds

This activity comprises the manufacturing of nitric acid and anhydrous ammonia.

- Manufacturing of nitric acid is eligible if the GHG emissions (calculated according to the methodology used for EU-ETS benchmarks) associated with the production processes are lower than the values of the related EU-ETS benchmarks. As of February 2020, the EU-ETS benchmarks values for the manufacturing of nitric acid are 0.302 tCO2e/t.
- Manufacturing of ammonia is eligible if the two following thresholds are met:
  - Scope 1 emissions lower than 1 tCO_2/t Ammonia, and
  - Combined CO_2 emissions (Scope 1 emissions and Scope 2 emissions, from electricity consumed) lower than 1.3 tCO_2/t Ammonia.
  - For the calculation of the emissions from the manufacturing process of Ammonia, both steps are considered: production of the intermediate product hydrogen and synthesis of the Ammonia. Scope 1 emissions encompass emissions from both steps.

Manufacture of plastics in primary form

Manufacture of plastics in primary form shall comply with at least one of the following three criteria, with additional criteria applying in specific cases (see below).

- The plastics in primary form are manufactured by mechanical recycling
- The plastics in primary form are manufactured by chemical recycling including: chemical depolymerisation (aka monomerisation), pyrolysis, gasification, solvent-based purification of polymers. When this criterion is applied, the carbon footprint of the plastics in primary form, manufactured by chemical recycling (excluding any calculated benefit from the production of fuels), shall be lower than the carbon footprint of the plastics in primary form manufactured with fossil fuel feedstock. The carbon footprint shall be calculated in accordance with ISO 14067:2018 and validated by a third party.
- Manufacture of plastics in primary form shall be wholly or partially derived from renewable feedstock and the carbon footprint of the plastics in primary form, manufactured wholly or partially from renewable feedstock shall be lower than the carbon footprint of the plastics in primary form

manufactured with fossil fuel feedstock. The carbon footprint shall be calculated in accordance with ISO 14067:2018 and validated by a third party. For the purpose of applying this criterion, renewable feedstock refers to biomass, industrial bio-waste or municipal bio-waste. Additional criteria apply in the case of renewable feedstock.

- In addition to the three criteria above, an independent sector study must confirm that at least 90% of the type of plastic manufactured is: (1) not used for single use consumer products, or (2) based on recycled plastics as feedstock.

Electricity, gas, steam, and air conditioning supply

Heat and electricity generation are responsible for over a quarter of the EU's greenhouse gas emissions (Eurostat, 2016[7]). Technology-agnostic criteria have been developed for different sources of electricity and heating and cooling. The criteria account for the important role in meeting the EU's net-zero emissions objective of improvements to the supporting infrastructure associated with delivering both types of energy. The TEG has developed these Taxonomy criteria for the energy sector so they can be used globally.

An overarching, technology-agnostic emissions intensity threshold of 100g CO_2e /kWh is proposed for electricity generation, heat production and the co-generation of heat and electricity. The calculation of the 100g CO2e / kWh threshold is based on the targets for future allowed emissions from the power sector in the EU, divided by the expected evolution of electricity demand[9]. This threshold will be reduced every five years in line with governmental targets set out to achieve net-zero emissions by 2050. For electricity and heat generation activities, an ISO 14067 or a GHG Protocol Product Lifecycle Standard compliant Product Carbon Footprint (PCF) assessment including measurement of fugitive emissions is required. This includes actual physical measurements of methane leakage from the point of extraction/well-head to production of energy (electricity and/or heat). The TEG acknowledged that improved standards and methodologies will develop and recommended that the acceptance of the ISO 14067, GHG Protocol Product Lifecycle Standard and the PCF methodologies be reviewed periodically by the Platform on Sustainable Finance. To aid the transition to a net-zero economy, certain technologies, such as solar, wind and tidal energy received a derogation from the requirement to conduct PCF's assessments on the basis that these technologies currently perform significantly below the emissions intensity threshold. These derogations are subject to regular review in accordance with the declining threshold. Furthermore, in the case where Carbon Capture and Storage (CCS) technologies are used to meet the emissions intensity threshold, a contractual agreement is required as proof to show that the carbon will be transported and sequestered in economic activities which are themselves eligible under the Taxonomy.

The threshold was determined as follows:

- Historical power sector emissions and electricity demand data for EU28 are sourced from Eurostat.
- Future emissions are in line with EU political commitments for the ETS sector (- 43% by 2030), then decline linearly to zero by 2050. Future electricity demand (net generation) is assumed to grow as per the EU 2016 PRIMES Reference Scenario.

These criteria imply that:

- Unabated natural-gas fired power generation is not expected to meet the required threshold. Gas-fired power with carbon capture and sequestration may qualify.
- Blended gas-fired power: Co-combustion of multiple gases for the production of electricity, heat/cool and co-generation is also subject to the emissions intensity threshold. This includes combustion of RED II gases.
- Hydropower: the embedded emissions associated with the construction of hydropower facilities and the alteration of landscapes constitute a significant portion of lifecycle analysis emissions. Such emissions can be compensated for, by a complementary emissions reduction activity.

The experts identified further economic activities that could be relevant for the Taxonomy. However, these activities could not be assessed in detail by the TEG and were left to future consideration by the Platform on Sustainable Finance. Such economic activities may include:

- The ownership, operation and recycling of energy storage facilities.
- Other gas infrastructure, except pipelines, which are relevant to the switch to hydrogen and zero-carbon gases and the recycling of existing gas infrastructure.
- CCU applications, which ensure CO2 retention,
- Other eligible energy (electricity, co-generation, heat/cool) assets that can be included, such as production of heat/cool from ocean energy.

Production of electricity from photovoltaic solar system (solar PV)

Any electricity generation technology can be included in the Taxonomy if it can be demonstrated, using an ISO 14067 or a GHG Protocol Product Lifecycle Standard-compliant Product Carbon Footprint (PCF) assessment, that the life cycle impacts for producing 1 kWh of electricity are below the declining threshold.

- Declining threshold: Facilities operating at life cycle emissions lower than 100g CO_2e/kWh, declining to net-0g CO_2e/kWh by 2050, are eligible.
- This threshold will be reduced every 5 years in line with a net-zero CO_2e in 2050 trajectory.
- Assets and activities must meet the threshold at the point in time when taxonomy approval is sought.
- For activities that operate beyond 2050, it must be technically feasible to reach net-zero emissions in Scope 1 emissions.

However:

- Solar PV is currently derogated from performing a PCF or GHG lifecycle assessment subject to regular review in accordance with the declining threshold.
- Solar PV is currently deemed to be Taxonomy eligible; this decision is subject to regular review.

Production of electricity from concentrated solar power (CSP)

The same contents as in paragraph 51 above applies. For activities which operate beyond 2050, it must be technically feasible to reach net-zero emissions.

However:

- CSP is currently derogated from performing a PCF or GHG lifecycle assessment subject to regular review in accordance with the declining threshold.
- CSP is currently deemed to be Taxonomy eligible; this decision is subject to regular review.
- Cogeneration of Heat and Power is covered under Construction and operation of a facility used for cogeneration of heat/cooling and Power threshold. Generation of heat/cool is covered under the Generation of heat/cool threshold.

Production of electricity from wind power

Any electricity generation technology can be included in the taxonomy if it can be demonstrated, using an ISO 14067 or a GHG Protocol Product Lifecycle Standard-compliant Product Carbon Footprint (PCF) assessment, that the life cycle impacts for producing 1 kWh of electricity are below the declining threshold.

- Declining threshold: Facilities operating at life cycle emissions lower than 100g CO2e/kWh, declining to net-0g CO2e/kWh by 2050, are eligible.

- This threshold will be reduced every 5 years in line with a net-zero CO2e in 2050 trajectory.
- Assets and activities must meet the threshold at the point in time when taxonomy approval is sought.
- For activities which operate beyond 2050, it must be technically feasible to reach net-zero emissions.

However:

- Wind power is currently derogated from performing a PCF or GHG lifecycle assessment subject to regular review in accordance with the declining threshold.
- Wind power is currently deemed to be Taxonomy eligible, which is subject to regular review.

Production of electricity from ocean energy

Any electricity generation technology can be included in the taxonomy if it can be demonstrated, using an ISO 14067 or a GHG Protocol Product Lifecycle Standard-compliant Product Carbon Footprint (PCF) assessment, that the life cycle impacts for producing 1 kWh of electricity are below the declining threshold.

- Declining threshold: Facilities operating at life cycle emissions lower than 100g CO_2e/kWh, declining to net-0g CO_2e/kWh by 2050, are eligible.
- This threshold will be reduced every 5 years in line with a net-zero CO_2e in 2050 trajectory.
- Assets and activities must meet the threshold at the point in time when taxonomy approval is sought.
- For activities which operate beyond 2050, it must be technically feasible to reach net-zero emissions.

However:

- Ocean energy is currently derogated from performing a PCF or GHG lifecycle assessment subject to regular review in accordance with the declining threshold.
- Ocean energy is currently deemed to be Taxonomy eligible, which is subject to regular review.
- Combined Heat and Power is covered under Construction and operation of a facility used for cogeneration of heat/cooling and Power threshold

Production of electricity from hydropower

Any electricity generation technology can be included in the taxonomy if it can be demonstrated, using an ISO 14067 or a GHG Protocol Product Lifecycle Standard-compliant Product Carbon Footprint (PCF) assessment, that the life cycle impacts for producing 1 kWh of electricity are below the declining threshold. Hydropower facilities with a power density above 5 W/m2 are currently derogated from conducting the PCF or GHG Lifecycle Assessment (subject to regular review in accordance with the declining threshold)[10]. As part of the ISO 14067 G-res tool[11] and the IEA Hydro Framework[12] are acceptable methodologies. Allocated emissions should be calculated according to the operating regime, as per the allocation methodology developed by UNESCO/IHA and embedded in the G-res tool and IEA Hydro Framework. These criteria also apply to pumped-storage facilities.

The full PCF assessment shall be subject to review.

- Declining threshold: Facilities operating at life cycle emissions lower than 100g CO_2e/kWh, declining to net-0g CO_2e/kWh by 2050, are eligible.
    - This threshold will be reduced every 5 years in line with a net-zero CO_2e in 2050 trajectory.

- Assets and activities must meet the threshold at the point in time when taxonomy approval is sought.
- For activities which operate beyond 2050, it must be technically feasible to reach net-zero emissions.

Production of electricity from geothermal sector

Any electricity generation technology can be included in the taxonomy if it can be demonstrated, using an ISO 14067 or a GHG Protocol Product Lifecycle Standard-compliant Product Carbon Footprint (PCF) assessment, that the life cycle impacts for producing 1 kWh of electricity are below the declining threshold[13]. A full PCF or GHG lifecycle assessment shall be applied, using project specific-data where relevant, and shall be subject to review.

- Declining threshold: Facilities operating at life cycle emissions lower than 100g CO_2e/kWh, declining to net-0g CO_2e/kWh by 2050, are eligible.
- This threshold will be reduced every 5 years in line with a net-zero CO_2e in 2050 trajectory.
- Assets and activities must meet the threshold at the point in time when taxonomy approval is sought.
- For activities which operate beyond 2050, it must be technically feasible to reach net-zero emissions.
- Combined Heat and Power is covered under Construction and operation of a facility used for cogeneration of heat/cooling and Power threshold

Production of electricity from gas (not exclusive to natural gas)

Any electricity generation technology can be included in the taxonomy if it can be demonstrated, using an ISO 14067 or a GHG Protocol Product Lifecycle Standard-compliant Product Carbon Footprint (PCF) assessment, that the life cycle impacts for producing 1 kWh of electricity are below the declining threshold. A full PCF shall be applied, using project specific data where relevant and shall be subject to review. This assessment should include actual physical measurements, i.e. methane leakage measurements across gas extraction, transport and storage systems.

- Declining threshold: Facilities operating at life cycle emissions lower than 100g CO_2e/kWh, declining to net-0g CO_2e/kWh by 2050, are eligible.
- This threshold will be reduced every 5 years in line with a net-zero CO_2e in 2050 trajectory.
- Assets and activities must meet the threshold at the point in time when taxonomy approval is sought.
- For activities which operate beyond 2050, it must be technically feasible to reach net-zero emissions.
- Facilities that will incorporate any form of abatement (e.g. CCS, Co-firing, other…) must show that the abatement activity is eligible under the Taxonomy.
- Electricity generation from other fossil-fuel based gases would be eligible under the Taxonomy, subject to meeting the declining emissions threshold.
- Combined Heat and Power is covered under Construction and operation of a facility used for cogeneration of heat/cooling and Power threshold.

Production of electricity from bioenergy (biomass, biogas and biofuels)

Production of electricity from biofuels shall be assessed in relation to the relative fossil fuel comparator set out in RED II. Facilities operating above 80% of GHG emissions-reduction in relation to the relative fossil

fuel comparator set out in RED II increasing to 100% by 2050, are eligible. Facilities must use feedstocks which meet the criteria on the manufacture of biomass, biogas and biofuels.

- This threshold will be reduced every 5 years in line with a net-zero CO_2e in 2050 trajectory.
- Assets and activities must meet the threshold at the point in time when taxonomy approval is sought.
- For activities that go beyond 2050, it must be technically feasible to reach net-zero emissions.
- For anaerobic digestion of biowaste and sewage sludge, reference is made to relevant Taxonomy activities. Any other anaerobic digestion of organic material is eligible provided that:

methane leakage from relevant facilities (e.g. for biogas production and storage, energy generation, digestate storage) is controlled by a monitoring plan.

the digestate produced is used as fertiliser/soil improver, directly or after composting or any other treatment.

Transmission and distribution of electricity

All electricity transmission and distribution infrastructure or equipment in systems that are on a trajectory to full decarbonisation (see below) are eligible, except for infrastructure that:

- Is dedicated to creating a direct connection, or expanding an existing direct connection between a power production plant that is more CO_2 intensive than 100 g CO_2e/kWh, measured on a Levelised Cost of Electricity (LCE) basis, and a substation or network.
- A system[14] is deemed to be on a trajectory to full decarbonisation if either
  - more than 67% of newly connected generation capacity in the system is below the generation threshold value of 100 g CO_2e/kWh measured on a PCF basis, over a rolling five-year period; or
  - the average system grid emissions factor is below the threshold value of 100 g CO2e/kWh measured on a PCF basis, over a rolling five-year average period. These criteria will be subject to regular review, in line with reviews of generation threshold values and progress to decarbonisation.
  - Based on the results of an assessment carried out in 2019 by the EU Joint Research Centre (JRC), the interconnected European system meets the criteria above that define a system to be on a trajectory to full decarbonisation. It, and its subordinated systems, meet the eligibility criteria for this activity and are derogated from carrying out the quantitative assessment. This derogation will also be subject to regular review, in line with review of the criteria above, or in case of major policy changes that would negatively affect commitments to decarbonisation.
- The following transmission and distribution (T&D) grid related activities are eligible, irrespective of whether the system is on a pathway to full decarbonisation:
  - Direct connection, or expansion of existing direct connection, of low carbon electricity generation below the threshold of 100 g CO2e/kWh declining to 0 g CO2e/kWh in 2050, measured on a PCF basis, to a substation or network.
  - Electric vehicle charging stations and supporting electric infrastructure for the electrification of transport, subject to Taxonomy eligibility under the transport section.
  - Installation of T&D transformers that comply with the Tier 2 (2021) requirements from Regulation 548/2014 on the eco-design of small, medium and large power transformers and, for medium power transformers with highest voltage for equipment not exceeding 36 kV, with AAA0 level requirements on no-load losses set out in standard EN 50588-1.

- Equipment and infrastructure where the main objective is an increase of the generation or use of renewable electricity generation
- Equipment to increase the controllability and observability of the electricity system and enable the development and integration of renewable energy sources (details are provided)
- Equipment to carry information to users for remotely acting on consumption
- Equipment to allow for exchange of renewable electricity between users

Interconnectors between transmission systems are eligible, provided that one of the systems is eligible.

Storage of electricity

This activity includes the construction and operation of facilities that store electricity and return it at a later time, in the form of electricity. Currently all electricity storage activities are eligible under the Taxonomy, subject to regular review. Eligibility criteria for demand side management (load shedding and load shifting) activities are available under the transmission & distribution of electricity criteria. However, hydropower pumped storage shall comply with the criteria for "production of electricity from hydropower".

Storage of thermal energy

This activity includes the construction and operation of facilities that store thermal energy, and return it at a later time, in the form of thermal energy or other energy vectors. Currently all thermal energy storage is eligible under the Taxonomy (including thermal energy storage (UTES) or aquifer thermal energy storage (ATES)), subject to regular review.

Storage of hydrogen

This activity includes the construction and operation of facilities that store hydrogen, and return it at a later time, in the form of hydrogen or other energy vectors. Currently construction of hydrogen storage assets is eligible under the Taxonomy, subject to regular review. Operation of hydrogen storage assets is eligible under the Taxonomy if the infrastructure is used to store Taxonomy-eligible hydrogen (see manufacture of hydrogen). Infrastructure that is required for zero direct emissions transport (e.g. hydrogen fuelling stations) is eligible under the transport section.

Manufacture of biomass, biogas or biofuels

The manufacture of biomass, biogas and biofuels is eligible if produced from the advanced feedstock listed in Part A of Annex IX of Directive (EU) 2018/2001. For anaerobic digestion of biowaste and sewage sludge, refer to the corresponding Taxonomy activities. Any other anaerobic digestion of organic material is eligible provided that:

- methane leakage from relevant facilities (e.g. for biogas production and storage, energy generation, digestate storage) is controlled by a monitoring plan;
- the digestate produced is used as fertiliser/soil improver, directly or after composting or any other treatment.

Retrofit of gas transmission and distribution networks

The complete system must have been in place and operating for a minimum of 5 years.

- Retrofit of gas transmission and distribution networks whose main purpose is the integration of hydrogen and other low-carbon gases is eligible.

- Any gas transmission or distribution network activities which enable the network to increase the blend of hydrogen and/or other low carbon gasses in the gas system is eligible
- The repair of existing gas pipelines for the reduction of methane leakage is eligible if the pipelines are hydrogen-ready and/or other low carbon gasses-ready.
- Retrofit of gas networks whose main purpose is the integration of captured CO_2 is eligible, if the operation of the pipeline meets the criteria outlined for the transportation of captured CO_2. Gas network expansion is not eligible.

District heating/cooling distribution

Construction and operation of pipelines and associated infrastructure for distributing heating and cooling is currently eligible, if the system meets the definition of efficient district heat/cool systems in the EU Energy Efficiency Directive. The EU Energy Efficiency Directive defines “efficient district heating and cooling” as a district heating or cooling system using at least 50% renewable energy or 50% waste heat or 75% cogenerated heat or 50% of a combination of such energy and heat. The following activities are always eligible:

- Modifications to lower temperature regimes
- Advanced pilot systems (control and energy management systems, internet of things).

Installation and operation of electric heat pumps

Currently, installation and operation of electric heat pumps is eligible (subject to regular review) under the following conditions:

- Refrigerant threshold: Global Warming Potential≤ 675; and
- equipment meets energy efficiency requirements stipulated in the implementing regulations under the Ecodesign Framework Directive[15]

Cogeneration of heat/cool and power from concentrated solar power

Any cogeneration technology can be included in the taxonomy if it can be demonstrated, the same conditions as in paragraph 51 above. However:

- Concentrated solar power is currently derogated from performing a PCF assessment, subject to regular review in accordance with the declining threshold.
- Concentrated solar power is currently deemed to be Taxonomy eligible, which is subject to regular review.
- Generation of heat/cool is covered under the generation of heat/cool threshold

Cogeneration of heat/cool and power from geothermal energy

Any cogeneration technology can be included in the Taxonomy under the same conditions as in paragraph 51 above. In addition, the full PCF assessment shall be subject to review.

Cogeneration of heat/cool and power from gas (not exclusive to natural gas)

Any cogeneration technology can be included in the Taxonomy if it can be demonstrated, using an ISO 14067 or a GHG Protocol Product Lifecycle Standard-compliant Product Carbon Footprint (PCF) assessment, that the life cycle impacts for producing 1 kWh of heat/cool and power are below the declining threshold. A full PCF shall be applied, using project specific data where relevant and shall be subject to

review. This assessment should include actual physical measurements, i.e. methane leakage measurements across gas extraction, transport and storage systems.

- Declining threshold: The cogeneration threshold is the combined heat/cool and power threshold of 100 g CO_2e/kWh.
- This threshold will be reduced every 5 years in line with a net-zero CO_2e in 2050 trajectory
- Assets and activities must meet the threshold at the point in time when Taxonomy approval is sought
- For activities which go beyond 2050, it must be technically feasible to reach net-zero emissions
- Facilities that will incorporate any form of abatement (e.g. CCS, Co-firing, other…) must show that the abatement activity is eligible under the Taxonomy
- The full PCF assessment shall be subject to review. Cogeneration from other fossil-fuel based gases would be eligible under the Taxonomy, subject to meeting the declining emissions threshold.

Cogeneration of heat/cool and power from bioenergy (biomass, biogas, biofuels)

Facilities operating above 80% of GHG emissions-reduction in relation to the relative fossil fuel comparator set out in Renewable Energy Directive II (RED II) increasing to 100% by 2050 are eligible. Facilities must use feedstocks which meet the criteria on the manufacture of biomass, biogas and biofuels.

- This threshold will be reduced every 5 years in line with a net-zero CO_2e in 2050 trajectory.
- Assets and activities must meet the threshold at the point in time when taxonomy approval is sought.
- For activities which go beyond 2050, it must be technically feasible to reach net-zero emissions.
- For anaerobic digestion of biowaste and sewage sludge, reference is made to the relevant Taxonomy activities. Any other anaerobic digestion of organic material is eligible provided that methane leakage from relevant facilities (e.g. for biogas production and storage, energy generation, digestate storage) is controlled by a monitoring plan; and the digestate produced is used as fertiliser/soil improver, directly or after composting or any other treatment

Production of heat/cool from concentrated solar power sector

Any heat/cool generation technology can be included in the Taxonomy if it can be demonstrated, using an ISO 14067 or a GHG Protocol Product Lifecycle Standard-compliant Product Carbon Footprint (PCF) assessment, that the life cycle impacts for producing 1 kWh of heat/cool are below the declining threshold.

- Declining threshold: Facilities operating at less than 100 g CO_2e/kWh, declining to 0g CO_2e /kWh by 2050, are eligible
- This threshold will be reduced every 5 years in line with a net-zero CO_2e in 2050 trajectory
- Assets and activities must meet the threshold at the point in time when Taxonomy approval is sought
- For activities which go beyond 2050, it must be technically feasible to reach net-zero emissions.

However:

- Concentrated solar power is currently derogated from performing a PCF assessment, subject to regular review in accordance with the declining threshold.
- Concentrated solar power is currently deemed to be Taxonomy eligible, which is subject to regular review.

Production of heat/cool from geothermal

Any heat/cool generation technology can be included in the Taxonomy if it can be demonstrated, using an ISO 14067 or a GHG Protocol Product Lifecycle Standard-compliant Product Carbon Footprint (PCF) assessment, that the life cycle impacts for producing 1 kWh of heat/cool are below the declining threshold.

- Declining threshold: Facilities operating at less than 100 g CO_2e/kWh, declining to 0g CO_2e /kWh by 2050, are eligible
- This threshold will be reduced every 5 years in line with a net-zero CO_2e in 2050 trajectory
- Assets and activities must meet the threshold at the point in time when Taxonomy approval is sought
- For activities which go beyond 2050, it must be technically feasible to reach net-zero emissions
- Cogeneration of heat and power is covered under the construction and operation of a facility used for cogeneration of heat/cooling and power threshold.

Production of heat/cool from gas combustion

Any heat/cool generation technology can be included in the Taxonomy if it can be demonstrated, using an ISO 14067 or a GHG Protocol Product Lifecycle Standard-compliant Product Carbon Footprint (PCF) assessment, that the life cycle impacts for producing 1 kWh of heat/cool and power are below the declining threshold. A full PCF shall be applied, using project specific data where relevant and shall be subject to review. This assessment should include actual physical measurements, i.e. methane leakage measurements across gas extraction, transport and storage systems.

- Declining threshold: The cogeneration threshold is the combined heat/cool and power threshold of 100 g CO_2e/kWh.
- This threshold will be reduced every 5 years in line with a net-zero CO_2e in 2050 trajectory
- Assets and activities must meet the threshold at the point in time when Taxonomy approval is sought
- For activities which go beyond 2050, it must be technically feasible to reach net-zero emissions
- Facilities that will incorporate any form of abatement (e.g. CCS, co-firing, other…) must show that the abatement activity is eligible under the Taxonomy
- The full PCF assessment shall be subject to review. Heat/cool generation from other fossil-fuel based gases would be eligible under the Taxonomy, subject to meeting the declining emissions threshold.

Production of heat/cool from bioenergy (biomass, biogas and biofuels)

Facilities operating above 80% of GHG emissions-reduction in relation to the relative fossil fuel comparator set out in RED II increasing to 100% by 2050, are eligible. Facilities must use feedstocks which meet the criteria on the manufacture of biomass, biogas and biofuels.

- This threshold will be reduced every 5 years in line with a net-zero CO_2e in 2050 trajectory
- Assets and activities must meet the threshold at the point in time when Taxonomy approval is sought
- For activities which go beyond 2050, it must be technically feasible to reach net-zero emissions
- For anaerobic digestion of biowaste and sewage sludge, reference is made to relevant Taxonomy activities. Any other anaerobic digestion of organic material is eligible provided that methane leakage from relevant facilities (e.g. for biogas production and storage, energy generation,

digestate storage) is controlled by a monitoring plan, and the digestate produced is used as fertiliser/soil improver, directly or after composting or any other treatment.

Production of heat/cool using waste heat

All recovery of waste heat is eligible.

Water, sewerage, waste and remediation (including carbon capture and storage)

These sectors are covered by NACE-Codes E36 to E39. They contribute to a rather small share of the EU's total greenhouse gas emissions – water with a 0.2% share and sewerage, waste, remediation with a 4.4% share in 2016. However, advanced solid waste management has the potential to trigger greenhouse gas emission reductions in other sectors of the economy through waste prevention, separate waste collection, waste reuse and recycling. Regarding waste incineration with energy recovery (waste-to-energy, WtE), the opinions of experts consulted by the TEG differed on whether this would be an appropriate environmentally sustainable activity offering a substantial contribution to climate mitigation. According to the political agreement on the Taxonomy Regulation, any activity leading to a significant increase in the incineration of waste (including WtE) is not considered an eligible activity. With the exception of the incineration of non-recyclable hazardous waste, waste incineration is deemed to cause harm to the environmental objectives of the circular economy as per Article 12(d) of the EU Taxonomy Regulation. Therefore, the TEG has not included WtE, but recommends bringing this matter for further discussion and consideration to the Platform on Sustainable Finance.

An important characteristic of the water, sewerage, waste and remediation sectors is that for the identified activities, the climate mitigation effect is an inherent result of key characteristic of the corresponding business model. For example, the energetic utilization of biogas produced through the anaerobic digestion of sewage sludge and bio-waste, or the material recovery from waste for reuse or recycling in other sectors. Hence, the choice of climate mitigation criteria mainly focused on qualitative metrics that seek to secure the execution of the activities/businesses themselves. Only in water collection, treatment and supply, the climate mitigation effect is the result of a more efficient design of the production process (e.g. by raising pump efficiency or reducing leakages). Consequently, concrete quantitative thresholds were defined.

Carbon capture and sequestration (CCS) was included in the Taxonomy because it is a key technology for the decarbonisation of the European Union (EU). It is included in all pathways presented by the European Commission in its Long-Term Strategic Vision document. CO_2 transport and storage are established and proven processes, with decades of operation and well-established regulation in the EU. CCS can be eligible in any sector/activity if it enables that primary activity to operate in compliance with the threshold - for example, steel, cement or electricity production. Whilst some CO_2 capture technologies can incur an 'energy penalty' of 10-15%, others do not. For example, the Allam cycle[16] being developed by the Net Power Company for natural gas combustion for power generation does not incur an energy penalty, as supercritical CO_2 is integrated fully into the power cycle as a coolant. This significantly reduces both energy and water demand. The TEG therefore warned against considering that CCS is a highly energy-intensive technology. The EU has provided clear and extensive assessment and monitoring requirements through the 2009 CO_2 Storage Directive. CO_2 has already been safely stored in geological formations in Europe for over 20 years.

Water collection, treatment and supply

The front-to-end water collection, treatment and supply system is eligible provided that its performance in terms of energy consumption per cubic meter of final water supply is high or substantially improved. Eligibility is demonstrated by adherence to one of two optional thresholds:

- Option 1: The front-to-end water supply system has a high degree of energy efficiency characterized by an average energy consumption of the system (including abstraction, treatment and distribution) of 0.5 kw/h per cubic meter billed/unbilled authorized water supply or less[17].
- Option 2: The energy efficiency of the front-to-end water supply system is increased substantially:
  - By decreasing the average energy consumption of the system by at least 20% (including abstraction, treatment and distribution; measured in kwh per cubic meter billed/unbilled authorized water supply);
  - Or by closing the gap between the actual leakage of the water supply network and a given target value of low leakage by at least 20%. The unit of measurement is the Infrastructure Leakage Index (ILI)18; the target value of low leakage is an ILI of 1.5.

Centralized wastewater treatment

Construction or extension of centralized wastewater systems including collection (sewer network) and treatment is eligible, provided that the new wastewater treatment acts as a substitute to more GHG emission intensive wastewater treatment systems (such as pit latrines, septic tanks, anaerobic lagoons etc.). No threshold applies.

Anaerobic digestion of sewage sludge

Anaerobic digestion of sewage sludge treatment is eligible provided that:

- Methane leakage from relevant facilities (e.g. for biogas production and storage, energy generation, digestate storage) is controlled by a monitoring plan; and,
- The produced biogas is used directly for the generation of electricity and/or heat, or upgraded to bio-methane for injection in the natural gas grid, or used as vehicle fuel (e.g. as bio CNG) or as feedstock in chemical industry (e.g. for production of H2 and NH3). No threshold applies.

Separate collection and transport of non-hazardous waste in source segregated fractions

- Separate collection and transport of non-hazardous waste is eligible provided that source segregated waste (in single or co-mingled fractions) is separately collected with the aim of preparing for reuse and/or recycling. No threshold applies.

Anaerobic digestion of bio-waste

Anaerobic digestion of bio-waste is eligible provided that:

- The bio-waste is source segregated and collected separately;
- Methane leakage from relevant facilities (e.g. for biogas production and storage, energy generation, digestate storage) is controlled by a monitoring plan;
- The produced biogas is used directly for the generation of electricity and/or heat, or upgraded to bio-methane for injection in the natural gas grid, or used as vehicle fuel (e.g. as bio CNG) or as feedstock in chemical industry (e.g. for production of H2 and NH3);
- The digestate produced is used as fertiliser/soil improver, directly or after composting or any other treatment; and,
- In dedicated bio-waste treatment plants, bio-waste 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. If energy crop feedstock covered by Annex IX is used (with a minor share up to 30%) it shall be produced according to criteria defined for Taxonomy Activities "Growing of perennial crops" or "Growing of non-perennial crops" and respect any additional national limitations established for the purpose of biogas production.

Composting of bio-waste

Composting of bio-waste is eligible provided that:

- The bio-waste is source segregated and collected separately;
- Anaerobic digestion is not a technically and economically viable alternative; and,
- The compost produced is used as fertiliser/soil improver[19]. No threshold applies.

Material recovery from non-hazardous waste

Material recovery from separately collected non-hazardous waste is eligible provided that:

- It produces secondary raw materials suitable for substitution of virgin materials in production processes; and
- At least 50%, in terms of weight, of the processed separately collected non-hazardous waste is converted into secondary raw materials.

Landfill gas capture and utilization

Collection and utilization of landfill gas is eligible provided that:

- The landfill has not been opened after the date of entry into force of the Taxonomy;
- The landfill (or landfill cell) where the system is newly installed (or extended and/or retrofitted) is permanently closed and is not taking further waste;
- The produced landfill gas is used directly for the generation of electricity and/or heat, or upgraded to bio-methane for injection in the natural gas grid, or used as vehicle fuel (e.g. as bio CNG) or as feedstock in chemical industry (e.g. for production of H2 and NH3); and,
- Methane emissions from the landfill and leakages from the landfill gas collection and utilization facilities are controlled by a monitoring plan. No threshold applies.

Direct Air Capture of CO_2

All activities pertaining to the direct capture of CO_2 from the atmosphere to lower global atmospheric CO_2 concentration levels are currently eligible, subject to regular review.

Capture of Anthropogenic Emissions

Capture of anthropogenic emissions is currently eligible provided that:

- It enables the economic activity to operate under its respective threshold; and,
- It demonstrates that the captured CO_2 will be offloaded to a Taxonomy eligible CO_2 transportation operation and permanent sequestration facility. This criterion is subject to regular review.

Transport of CO_2

Transport modalities that contribute to the transport of CO_2 to eligible permanent sequestration sites are eligible, only if the asset operates below the leakage/tonne of CO_2 threshold. Leakage/tonne of CO_2

transported from head(s) of the carbon dioxide transport network to injection point(s) must be <0.5%. The CO_2 must be delivered to a Taxonomy-eligible permanent sequestration site or to other transport modalities which lead directly to an eligible permanent sequestration site. For assets or activities that enable carbon capture and use (CCU), any and all of the connected elements of an existing transport network are ineligible. Assets which increase the flexibility and management of an existing network, without expanding the network to include carbon capture and use activities, are eligible. This criterion is subject to regular review.

Permanent Sequestration of Captured CO_2

Operation of a permanent CO_2 storage facility is eligible if the facility complies with ISO 27914:2017 for geological storage of CO_2. These requirements are subject to periodic review.

Transportation and storage

To achieve climate neutrality, a 90% reduction in transport emissions is needed by 2050 (compared to 1990). Road, rail, aviation, and waterborne transport will all need to contribute to the reduction[20]. Preliminary estimates from EU Member States show that GHG emissions from transport were 29% above 1990 levels in 2018[21].They now account for more than one quarter of the EU's total greenhouse gas emissions. Within the transport sector, road transport is the dominant emissions source, accounting for more than two-thirds (71.7%[22]) of transport-related greenhouse gas emissions. Passenger cars and vans are responsible for the bulk of these emissions, with the rest resulting from trucks and buses. Road transport is followed by shipping and aviation as the second and third largest sources of GHG emissions from transport.

For road vehicles there is a well-developed legislative framework in the EU that includes mandatory emissions testing. This system is most mature for cars and vans. It has recently evolved significantly for trucks, and buses are set to follow. Rail and inland waterways are also important emissions sources covered by the Taxonomy, ones which can provide modal shift benefits, relative to road and air. However, EU legislation provides less direct orientation regarding these modes of transport. The transport section of the climate mitigation Taxonomy deals primarily with climate mitigation activities relating to operations of vehicle/vessel fleets and the associated enabling infrastructure. The Taxonomy criteria for the manufacturing of vehicles and vessels are addressed in the manufacturing section of the Taxonomy.

There are several principal options[23] for climate mitigation in the transport sector, including:

- Increasing the number of low- and zero emission vehicles, improving vehicle efficiency and infrastructure
- Increasing substitution of fossil fuels with sustainable alternative and net-zero carbon fuels[24]
- Improving efficiency of the overall transport/mobility system.

The general Taxonomy approach for transport was inspired by the long-term strategic options for decarbonisation of the transport sector as per the Commission's long-term strategic vision 'A Clean Planet for All'[25]. Criteria developed for fleet efficiency and fuel substitution were designed to be discrete, and refer to relevant EU legislation. For fleet efficiency criteria, tank-to-wheel criteria were used since the basis for criteria is the Clean Vehicles Directive, the post-2020 CO_2 Regulation for cars and vans and the Heavy Duty CO_2 regulation. Life-cycle and well-to-wheel considerations for thresholds are pending a possible development of an agreement on a common Union methodology as per the above mentioned legislations.

In addition, it is noted in 'A Clean Planet for All' that land constraints imply that biofuels and bio methane should be deployed only in those transport modes or means where they are necessary. The scope of economic activities and the type of criteria proposed in this section may help to inform the design of

technical criteria for the transport sector beyond the EU. However, the quantitative thresholds proposed are EU-focused by design given the EU Taxonomy regulation itself, but also because they are based on EU legal reference points.

At this stage, there are other activities in the transport sector that have not been addressed, but which need consideration as part of further work on the Taxonomy, e.g. by the Platform on Sustainable Finance.

These include:

- Maritime shipping (including reference to EU MRV regime)
- Aviation
- ICT for transport
- Energy efficiency improvements in equipment and infrastructure (e.g. in ports)
- Research, development & innovation related activities having the potential to substantially decarbonise the transport sector.

Passenger rail transport (interurban)

- Zero direct emissions trains are eligible.
- Other trains are eligible if direct emissions (TTW) are below 50g CO_2e emissions per passenger kilometre (g CO_2e/pkm) until 2025 (non-eligible thereafter).

Brief rationale: Zero direct emissions rail (e.g. electric, hydrogen) is eligible because:

- With the present energy mix, the overall emissions associated with zero direct emissions rail transport (i.e. electric or hydrogen) are among the lowest compared with other transport modes.
- The generation of the energy carriers used by zero direct emissions transport is assumed to become low or zero carbon in the near future.
- The threshold of 50g CO_2e/p/km until 2025 ensures that the carbon intensity remains similar to criteria for eligible road vehicles with low occupation factor (50g CO_2/vkm) and significantly lower than emissions for an average car in the current vehicle stock.

Freight rail transport

- Zero direct emissions trains (e.g. hydrogen, electric) are eligible.
- Other trains are eligible if direct emissions per tonne-km (g CO_2 e/t/km) are 50% lower than average reference CO_2 emissions of HDVs as defined for the Heavy Duty CO_2 Regulation, to be reviewed in 2025.
- Rail that is dedicated to the transport of fossil fuels or fossil fuels blended with alternative fuels is not eligible even if meeting the criteria above.

Brief rationale: Zero direct emissions rail (e.g. electric, hydrogen) is eligible because:

- With the present energy mix, the overall emissions associated with zero direct emissions rail transport (i.e. electric or hydrogen) are among the lowest compared with other transport modes.
- The generation of the energy carriers used by zero direct emissions transport is assumed to become low or zero carbon in the near future.
- The threshold of 50% lower than average reference CO_2 emissions of HDVs ensures that the carbon intensity remains similar to criteria for eligible road freight vehicles, with a review in 2025 to assess technology developments in the freight transport sector. The Heavy Duty CO_2 Regulation uses a g CO_2/km metric. To convert this to a gCO_2/tonne-km metric, the average payload for the road freight vehicles should be applied. Once reference value data is available, it is expected that

the taxonomy will specify CO_2e/tkm threshold value generation of the energy carriers used by zero direct emissions transport is assumed to become low or zero carbon in the near future.

Public transport

- Zero direct emissions land transport activities (e.g. light rail transit, metro, tram, trolleybus, bus and rail) are eligible.
- Other fleets are eligible if direct emissions are below 50 g CO_2e/p/km until 2025 (non-eligible thereafter)

Brief rationale: Zero direct emissions public transport (e.g. electric, hydrogen) is eligible because:

- With the present energy mix, the overall emissions associated with zero direct emissions public transport (i.e. electric or hydrogen) are among the lowest compared with other transport modes.
- The generation of the energy carriers used by zero direct emissions transport is assumed to become low or zero carbon in the near future.
- The threshold of 50 g CO_2e/p/km until 2025 ensures that the carbon intensity remains similar to criteria for eligible road vehicles with low occupation factor (50 g CO_2/v/km) and significantly lower than emissions for an average car.

Infrastructure for low carbon transport (land transport)

The construction and operation of transport infrastructure is eligible in the following cases:

- Infrastructure that is required for zero direct emissions transport (e.g. electric charging points, electricity grid connection upgrades, hydrogen fuelling stations or electric highways).
- Infrastructure and equipment (including fleets) for active mobility (walking, cycling, e-bikes and e-scooters).
- Infrastructure that is predominantly used for low-carbon transport if the fleet that uses the infrastructure meets the thresholds for direct emissions as defined in the relevant activity - measured in CO_2 emissions per kilometre (g CO_2/km), CO_2e emissions per tonne-kilometre (g CO_2e/t/km), or CO_2e emissions per passenger-kilometre (g CO_2CO2e/p/km).
- Non-electrified rail infrastructure with an existing plan for electrification or use of alternatively powered trains.

For all cases:

- Only infrastructure that is fundamental to the operation of the transport service is eligible.
- Infrastructure that is dedicated to the transport of fossil fuels or blended fossil fuels is not eligible.

Brief Rationale: The construction and operation of infrastructure for low carbon land transport is considered eligible because this is considered a key enabling factor for improving the uptake of the transport activities that are considered eligible under the rest of the land transport section of the Taxonomy. Eligibility for infrastructure is linked to eligibility criteria for fleets using the infrastructure, with additional criteria relating to zero carbon transport (active mobility).

Passenger cars and commercial vehicles

For passenger cars and light commercial vehicles:

- Zero tailpipe emission vehicles (incl. hydrogen, fuel cell, electric). These are automatically eligible.
- Vehicles with tailpipe emission intensity of max 50 g CO_2/km (WLTP) are eligible until 2025.
- From 2026 onwards only vehicles with emission intensity of 0g CO_2/km (WLTP) are eligible.

- For category L vehicles (e.g. motorcycles): Zero tailpipe emission vehicles (incl. hydrogen, fuel cell, electric).

Brief rationale: Zero direct emissions vehicles (e.g. electric, hydrogen) are eligible because the generation of the energy carriers used by zero tailpipe emissions vehicles is assumed to become low or zero carbon in the near future. Vehicles with tailpipe emission intensity of max 50 g CO_2/km (WLTP) are eligible until 2025 because the post-2020 CO_2 Regulation for cars and vans sets this threshold as an ambitious mid-term target that is significantly below the expected average emissions of new cars and vans. The 50 g CO_2/km threshold does not apply to L vehicles due to their lower weight and high electrification potential.

Freight transport services by road

- Zero direct emission heavy-duty vehicles that emit less than 1g CO_2/kWh (or 1g CO_2/km for certain N2 vehicles) are automatically eligible;
- Low-emission heavy-duty vehicles with specific direct CO_2 emissions of less than 50% of the reference CO_2 emissions of all vehicles in the same sub-group are eligible.
- Dedicated vehicles solely using advanced biofuels or renewable liquid and gaseous transport fuels of non-biological origin as defined in Art. 2 (34) and Art. 2 (36) as well as low indirect land-use change-risk biofuels as defined in Art 2(37) in line with Directive (EU) 2018/2001), guaranteed either by technological design or ongoing monitoring and third-party verification. In addition, for an investment in new vehicles, only vehicles with efficiency corresponding to direct CO_2 emissions (g CO_2/ km) (biogenic CO_2) below the reference CO_2 emissions of all vehicles in the same sub-group are eligible. Eligibility should be reviewed latest by 2025.or when Directive (EU) 2018/2001) is reviewed.
- Fleets of vehicles dedicated to transport fossil fuels or fossil fuels blended with alternative fuels are not eligible. Brief rationale: Road freight transport with zero direct emissions vehicles (e.g. electric, hydrogen) is eligible because the generation of these energy carriers is assumed to become low or zero carbon in the near future. The definition is aligned with the heavy duty CO_2 regulation, which provides the most recent legislative point of reference. Road freight transport with low-emission heavy-duty vehicles defined in the same regulation and dedicated vehicles solely using a narrowly defined range of bio- or other renewable fuels are also eligible due to the relatively high challenges in electrifying this vehicle category. Substantial contribution to climate mitigation from fuel substitution is in line with the agreed Taxonomy regulation.

Interurban scheduled road transport

- Zero tailpipe emission vehicles (incl. hydrogen, fuel cell, electric) are automatically eligible.
- Dedicated vehicles solely using advanced biofuels or renewable liquid and gaseous transport fuels of non-biological origin as defined in Art. 2 (34) and Art. 2 (36) in line with Directive (EU) 2018/2001), guaranteed either by technological design or ongoing monitoring and third-party verification. In addition, for an investment in new vehicles, only vehicles with efficiency corresponding to direct emissions below 95g CO_2 e /p/km (including biogenic CO_2) are eligible. Eligibility should be reviewed latest by 2025, or when Directive (EU) 2018/2001) is reviewed.
- Other vehicles are eligible if direct emissions are below 50 g CO_2e/p/km.

Brief rationale: Passenger transport with zero tailpipe emissions vehicles (e.g. electric, hydrogen) is eligible because the generation of these energy carriers is assumed to become low or zero carbon in the near future. Dedicated vehicles solely using a narrowly defined range of bio- or other renewable fuels are also eligible due to the relatively high challenges in electrifying the vehicle category typically used on interurban routes. Substantial contribution to climate mitigation from fuel substitution is in line with the agreed

Taxonomy regulation. The threshold of 50g CO_2e/p/km relates to the thresholds set for passenger cars (assuming occupancy of one) and represents a value that is significantly below average new car emissions.

Inland passenger water transport

Zero direct emissions inland waterway vessels are eligible.

- Dedicated vessels solely using advanced biofuels or renewable liquid and gaseous transport fuels of non-biological origin as defined in Art. 2 (34) and Art. 2 (36) in line with Directive (EU) 2018/2001), guaranteed either by technological design or ongoing monitoring and third-party verification. In addition, for an investment in new vessels, only vessels with efficiency corresponding to direct emissions below 95g CO_2 e /p/km (including biogenic CO_2) are eligible. Eligibility should be reviewed latest by 2025, or when Directive (EU) 2018/2001) is reviewed.

Other Inland waterways vessels are eligible if direct emissions are below 50 g CO_2e emissions per passenger kilometre (g CO_2e/p/km) (or 92.6 g per passenger nautical mile (g CO_2e/pnm)). Eligibility should be reviewed in 2025.

Brief Rationale: Zero direct emissions inland waterway transport (e.g. electric, hydrogen) is eligible because:

- With the present energy mix, the overall emissions associated with zero direct emissions rail transport (i.e. electric or hydrogen) are among the lowest compared with other transport modes.
- The generation of the energy carriers used by zero direct emissions transport is assumed to become low or zero carbon in the near future.

Inland freight water transport

Zero direct emissions inland waterways vessels are eligible.

- Dedicated vessels solely using advanced biofuels or renewable liquid and gaseous transport fuels of non-biological origin as defined in Art. 2 (34) and Art. 2 (36) in line with Directive (EU) 2018/2001), guaranteed either by technological design or ongoing third-party monitoring and verification. In addition, for an investment in new vessels, only vessels with efficiency corresponding to direct CO_2 emissions (g CO_2/t/km) (including biogenic CO_2) below the average reference value defined for HDVs (Heavy Duty CO_2 Regulation) are eligible. Eligibility should be reviewed in 2025, or when Directive (EU) 2018/2001) is reviewed.
- Other inland waterway vessels are eligible if direct emissions per tkm CO_2e emissions per tonne kilometre (g CO_2e/tkm) or per tonne nautical mile (g CO_2e/tnm) are 50% lower than the average reference value defined for HDVs (Heavy Duty CO_2 Regulation). Eligibility should be reviewed in 2025.
- Vessels that are dedicated to the transport of fossil fuels or any blended fossil fuels are not eligible even if meeting the criteria above.

Brief rationale: Zero direct emissions inland waterway transport (e.g. electric, hydrogen) is eligible because:

- With the present energy mix, the overall emissions associated with zero direct emissions waterways transport (i.e. electric or hydrogen) are among the lowest compared with other transport modes.
- The generation of the energy carriers used by zero direct emissions transport is assumed to become low or zero carbon in the near future. The threshold of 50% lower than average reference CO_2 emissions of HDVs ensures that the carbon intensity remains similar to criteria for eligible road freight vehicles, with a review in 2025 to assess technology developments in the freight transport

sector. The Heavy Duty CO_2 Regulation uses a g CO_2/km metric. To convert this to a g CO_2/tonne-km metric, the average payload for the road freight vehicles should be applied. Once reference value data is available, it is expected that the taxonomy will specify CO_2e/t/km threshold values. Substantial contribution to climate mitigation from fuel substitution is in line with the agreed taxonomy regulation.

Infrastructure for low carbon transport (water transport)

The construction and operation of transport infrastructure is eligible in the following cases:

- Infrastructure that is required for zero direct emissions water transport (e.g. batteries or hydrogen fuelling facilities) is eligible.
- Infrastructure dedicated to supporting the renewable energy sector.
- Infrastructure that is predominantly used for low-carbon transport is eligible if the fleet that uses the infrastructure meets the thresholds for direct emissions as defined in the relevant activity - measured in CO_2e emissions per passenger-kilometre (g CO_2e/p/km),per tonne-kilometre (g CO_2e/t/km), per passenger nautical mile (g CO_2e/pnm) or per tonne nautical mile (g CO_2e/t/nm)[26].

For all cases:

- Only infrastructure that is fundamental to the operation of the transport service is eligible.
- Infrastructure that is dedicated to the transport of fossil fuels or blended fossil fuels is not eligible.

Brief rationale: The construction and operation of infrastructure for low carbon water transport is considered eligible because this is considered a key enabling factor for improving the uptake of the transport activities that are considered eligible under the rest of the land transport section of the Taxonomy. Eligibility for infrastructure is linked to eligibility criteria for fleets using the infrastructure, with additional criteria relating to infrastructure supporting the renewable energy sector.

Information and communications

This discussion focuses on NACE sector J – Information and Communication, which does not include electronics manufacturing. Based on the estimates published by the "European Framework Initiative for Energy & Environmental Efficiency in the ICT Sector"[27], the demand for telecommunications services is growing consistently. Internet Protocol (IP) traffic (data through telecom networks) has been estimated to be growing at a Compound Annual Growth Rate (CAGR) of 26 percent from 2017 to 2022[28].

The European Commission Joint Research Centre estimated total annual energy consumption of data centres in Western Europe as 56 TW/h (or 2% of the total electricity consumption) per year. In 2012, this was projected to increase to 104 TW/h (or 4%) per year by 2020. The large consumption of energy is due to the need for permanent storage of data (24 hour availability, back-up generators, etc.) and the need for cooling of the servers and other equipment to maintain optimal operating temperatures[29]. Given the complexity of data centres – which encompass hardware, software, cooling systems, monitoring and back-up energy systems, only to name a few components – and the trade-offs that are present in the industry between energy efficiency and reliability and security, a comprehensive approach was adopted. The "threshold" for significant contribution to mitigation is data centre compliance with the more advanced standard of energy efficiency available for this sector, the Best Practice Guidelines for the EU Code of Conduct on Data Centre Energy Efficiency (JRC) updated every year by the Commission to take account of technological advances[30].

In terms of sectors not yet covered under information and communications, the TEG recommends that the Commission undertake work on the following activities:

- Telecommunication networks
- Energy efficiency of software
- Context-specific digitalisation solutions for resource efficiency, or software applications that minimize resource consumption in other sectors of the economy. Examples include:
  - Transport: Electric-vehicle smart charging - manage Electric Vehicle charging stations smartly to leverage the extra storage capacity connected to the grid.
  - Agriculture: Precision agriculture digital solutions – allow, for example, for the right amount of water for irrigation, or fertiliser use.
  - Energy: Innovative grid equipment (e.g. short circuit breakers) to ensure security in grids with growing decentralised renewable production.

Data processing, hosting and related activities

Threshold: The data centre implements the European Code of Conduct for Data Centre Energy Efficiency. This implies implementation of the practices described in the most recent "Best Practice Guidelines for the European Code of Conduct for Data Centre Energy Efficiency" (JRC) or in CEN/CENELEC documents CLC TR50600-99-1 and CLC TR50600-99-2.

Data-driven solutions for GHG emission reductions

- The option to adopt a threshold for multi-purpose solutions (e.g. "50% of activity has to be applied to climate change") has been considered but rejected in light of the lack of control over the use of the data and analytics by the end user.
- The mix of NACE codes (telecommunication, software and data processing) is necessary to keep the category open to solutions that will emerge in the future.
- Exclusive use of data for climate change mitigation purposes is deemed sufficient to prove significant mitigation contribution and avoid application of thresholds.
- Example: Advanced weather forecasting models tailored to integrating more renewables in electricity generation. Digital technologies, such as machine-learning algorithms, when applied to weather and power plant output data, can increase the accuracy of renewable forecasts.
- Geographical scope: Global.

Construction and real estate activities

Buildings are not a single economic activity under the NACE system. The TEG recognised that failure to address the carbon performance of buildings, which alone contribute 36% of CO_{2e} emissions in the EU28[31], would risk causing harm to climate objectives. The TEG's buildings criteria are designed to be cross-cutting and apply across the economy, with the exception of explicitly excluded sectors (dedicated storage of fossil fuels). For presentation purposes, the TEG has aligned the building criteria with NACE codes for construction and real estate activities. However, the buildings criteria are not limited to these NACE codes and can be applied across other sectors and economic activities.

About three-quarters of European buildings are considered inefficient, and only 0.4-1.2% (depending on the country) of the building stock is renovated each year to improve its efficiency[32]. Renovation rates must be increased in order to put the building stock on a net-zero emissions pathway, while embodied and operational carbon emissions of new buildings must be significantly reduced in order to minimise their impact over their life cycle.

The Taxonomy distinguishes four 'economic activities' and defines consistent mitigation criteria that enable an eligibility assessment of investments in construction and real estate on the basis of their potential impact on building energy performance and thus carbon emissions.

Construction of new buildings: this activity covers real estate development and enables accounting of project capital expenditures of developers and construction clients as eligible 'low-carbon activities', as well as turnover of developers and contractors.

Building renovation: this activity covers comprehensive renovation and enables accounting of:

- Project capital expenditures for renovation as eligible 'transition activities':
  - When expenditures can be distinguished by type, at least 50% must be related to energy-efficiency measures in order to consider the renovation expenditures as eligible in their entirety[33].
  - When expenditures cannot be distinguished by type, 50% of the total renovation expenditures may be counted as the proxy representing energy-efficiency measures.
  - Turn-over of contractors.

Individual measures and professional services: this activity covers technical interventions aimed at increasing energy efficiency and professional services that are functional to energy improvements, and enables accounting of:

- Project capital expenditures of clients as eligible 'transition activities';
- Turn-over of installers and services providers.

Acquisition and ownership: this activity covers the purchase and management of buildings, and enables accounting of:

- Project capital expenditures of the buyer/owner as eligible 'transition activities' or 'low carbon activities' depending on building performance;
- Turnover of real estate brokers and facility managers.

The TEG faced several challenges to develop appropriate mitigation criteria for the construction and real estate sectors:

- The lack of consistent and comparable data across countries for benchmarking building stock performance and setting suitable thresholds for the top performing buildings within the respective national stock.
- The inherent difficulty of creating a level playing field across countries with different climates and degrees of market readiness.
- The desire to find a compromise between increasing ambition and building upon already existing 'green' financing instruments. The financing of buildings and building energy improvements is the most developed segment of the green finance market, and the ownership of buildings in portfolios is an extensively practiced economic activity. As the Taxonomy is introduced to the market, it is important to maintain the volume of existing investors and enable them to use the Taxonomy to evaluate their portfolios.
- The intention is to direct finance towards new buildings designed to higher standards than mandatory design and construction requirements, considering the varying levels of ambition and rigour regarding the implementation of nearly zero-energy buildings (NZEB) across EU Member States[34].

These principles led the TEG to develop the following criteria to identify environmentally sustainable activities in terms of substantial contribution to climate change mitigation:

Construction of new buildings: to be eligible, the design and construction of new buildings needs to ensure a net primary energy demand that is at least 20% lower than the level mandated by national regulations. This is assessed through the calculated energy performance of the building, i.e. performance forecasted on the basis of modelling building physics under typical climatic and occupancy conditions. This criterion is meant to be subject to reviews in the transitional decade 2020-2030 in order to take into account potential tightening of NZEB requirements by EU Member States, with the aim of setting the whole sector on a path to convergence with net-zero energy and carbon targets by 2030.

Building renovations: renovations designed to meet the local national or regional requirements for 'major renovation' as defined in the Energy Performance of Buildings Directive (EPBD)[35]; this will stimulate the market and encourage building owners undertaking a 'conventional' renovation to include energy-efficiency measures established by EU Member States in national and regional regulations implementing the EPBD. As an alternative, renovations are eligible if undertaken to ensure at least 30% savings in net primary energy demand in comparison to the baseline energy performance of the building before the renovation, assessed through the calculated energy performance of the building.

Individual measures and professional services: measures and services aimed at reducing energy and/or carbon emissions in buildings. This is assessed through technical requirements for each measure and service.

Acquisition and ownership: buildings built after 2021 are eligible if they meet the criteria for the 'Construction of new buildings', while buildings built before 2021 are eligible if their performance is comparable to the performance of the top 15% of the national stock, in terms of calculated Primary Energy Demand during the use phase. An additional requirement is applied only to large non-residential buildings (built both before and after 2021) to ensure efficient operations through energy management.

Outside the EU, the share of the market that could be eligible will also vary from country to country. Countries with ambitious building regulations that are accepted as Taxonomy-equivalent will more easily be able to make large shares of their market eligible. The principle of the top performing 15% of the national stock provides a methodology to demonstrate eligibility of the non-EU best in class building stock. For renovations, the 30% energy savings threshold (the alternative to the compliance with 'major renovation' requirements) will not only facilitate immediate functionality of the Taxonomy outside the EU, it will also make a significant part of renovation activities eligible, even in countries where national building regulations may not be ambitious enough. Moreover, the share of the market that could be eligible outside EU Member States will also depend on the local proliferation of Taxonomy-eligible sustainability certification schemes.

In terms of recommendations to the Commission for the next steps, methods and tools for embodied carbon assessment based on Life Cycle Assessment (LCA) are becoming more widespread. Notably, a large share of emissions embodied in buildings takes place during resource extraction and product manufacturing, before buildings are even occupied. This means that all new constructions begin their lifecycle with a significant amount of embodied carbon. The Sustainable Finance Platform could gather and analyse existing data in order to establish reliable thresholds for carbon emission embodied in new constructions, which would be integrated into the Taxonomy criteria for the activity 'Construction of new buildings' as additional threshold to be met.

Construction of new buildings

The metric is Primary Energy Demand (PED), defining the energy performance of a building: the annual primary energy demand associated with regulated energy use during the operational phase of the building life-cycle (i.e. 'module B6' as defined in EN15978), calculated ex-ante according to the national methodologies for asset design assessment, or as defined in the set of standards ISO 52000, expressed as kWh/m^2 per year. The threshold is based on 'nearly zero-energy building' (NZEB) requirements, which

are defined in national regulation implementing the EPBD and are mandatory for all new buildings across EU Member States from 2021.

To be eligible, the net primary energy demand of the new construction must be at least 20% lower than the primary energy demand resulting from the relevant NZEB requirements[36]. This reduction can be met through a direct decrease of the primary energy demand via a more efficient design or by offsetting with on-site and off-site renewable generation, or a combination of both strategies. Off-site energy generation must be limited to district heating and cooling systems and local renewable energy sources[37]. The methodology used for the measurement of floor area should be stated referring to the categories defined in the International Property Measurement Standards[38].

Building renovation

The thresholds used to assess a renovation rely on either the respective metrics set in the applicable building energy performance regulation for 'major renovation' transposing the EPBD, or, in the case of relative improvement, on Primary Energy Demand (PED) defined as follows: the annual primary energy demand associated with regulated energy use during the operational phase of the building life-cycle (i.e. 'module B6' according to EN15978), calculated ex-ante according to the national methodologies for asset design assessment, or as defined in the set of standards ISO 52000, expressed as kWh/m2 per year.

A renovation is eligible when it meets either one of the following thresholds:

- Major renovation[39]: the renovation is compliant with the requirements set in the applicable building regulations for 'major renovation' transposing the Energy Performance of Buildings Directive (EPBD). The energy performance of the building or the renovated part upgraded must meet cost-optimal minimum energy performance requirements in accordance with the EPBD.
- Relative improvement: the renovation leads to reduction of Primary Energy Demand of at least 30% in comparison to the energy performance of the building before the renovation[40]. The initial energy performance and the estimated improvement shall be based on a specialised building survey and validated by an Energy Performance Certificate, an energy audit conducted by an accredited independent expert or any other transparent and proportionate method. The methodology used for the measurement of floor area should be stated referring to the categories defined in the International Property Measurement Standards[41].

Individual measures and professional services

There are no defined metrics across the individual measures and professional services. The following individual measures are eligible if compliant with minimum requirements set for individual components and systems in the applicable national regulations transposing the Energy Performance Building Directive (EPBD), and must meet Ecodesign requirements pursuant to Directive 2009/125/EC:

- Addition of insulation to the existing envelope components, such as external walls, roofs (including green roofs), lofts, basements and ground floors (including measures to ensure air-tightness, measures to reduce the effects of thermal bridges and scaffolding) and products for the application of the insulation to the building envelope (mechanical fixings, adhesive, etc.).
- Replacement of existing windows with new energy efficient windows.
- Replacement of existing external doors with new energy efficient doors.
- Installation and replacement of heating, ventilation and air conditioning and domestic hot water systems, including equipment related to district heating service.
- Replacement of inefficient boiler or stove with highly efficient condensing boiler.

The following individual measures are eligible if specific requirements are met:

- Replacement of old pumps with efficient circulating pumps (as defined in Art. 2 of EU Regulation 622/2012).
- Installation of efficient LED lighting appliances and systems.
- Installation of low-flow kitchen and sanitary water fittings in the top two categories of the EU Water Label scheme.

The following individual measures are always eligible:

- Installation of zoned thermostats, smart thermostat systems and sensoring equipment, e.g. motion and day light control.
- Installation of Building Management Systems (BMS) and Energy Management Systems (EMS).
- Installation of charging stations for electric vehicles.
- Installation of smart meters for gas and electricity.
- Installation of façade and roofing elements with a solar shading or solar control function, including those that support the growing of vegetation.

The following individual measures are eligible if installed on-site as building services:

- Installation of solar photovoltaic systems (and the ancillary technical equipment).
- Installation of solar hot water panels (and the ancillary technical equipment).
- Installation and upgrade of heat pumps contributing to the targets for renewable energy in heating and cooling in accordance with Directive 2018/2001/EU (and the ancillary technical equipment).
- Installation of wind turbines (and the ancillary technical equipment).
- Installation of solar transpired collectors (and the ancillary technical equipment).
- Installation of thermal or electric energy storage units (and the ancillary technical equipment).
- Installation of High Efficiency Micro CHP (combined heat and power) plant
- Installation of heat exchanger/recovery systems.

The following professional services are eligible:

- Technical consultations (energy consultants, energy simulation, project management, production of EPC, dedicated training, etc.) linked to the individual measures mentioned above.
- Accredited energy audits and building performance assessments.
- Energy Management Services.
- Energy Performance Contracts.
- Energy Services provided by Energy Service Companies (ESCOs).

Acquisition and ownership

The metric is Primary Energy Demand (PED): the annual primary energy demand associated with regulated energy use during the operational phase of the building life-cycle (i.e. 'module B6' according to EN15978), calculated ex-ante according to the national methodologies for asset design assessment, or as defined in the set of standards ISO 52000, expressed as kWh/m^2 per year.

Case A – Acquisition of buildings built before 31 December 2020

The calculated performance of the building must be within the top 15% of the local existing stock in terms of operational Primary Energy Demand, expressed as kWh/m^2/year. Alignment with this criterion can be demonstrated by providing adequate evidence comparing the performance of the relevant asset to the performance of the local stock built before 31 December 2020. Such evidence should be based on a representative sample of the building stock in the respective area where the building is located,

distinguishing at the very least between residential and non-residential buildings. The area can be defined as a city, a region or a country. Certification schemes such as EPCs may be used as evidence of eligibility when adequate data is available to demonstrate that a specific level (e.g. EPC A) clearly falls within the top 15% of the respective local stock. Large non-residential buildings must meet an additional requirement: efficient building operations must be ensured through dedicated energy management[42].

Case B – Acquisition of buildings built after 31 December 2020

The building must meet the criteria established for the 'Construction of new buildings' that are relevant at the time of the acquisition. Large non-residential buildings must meet an additional requirement: efficient building operations must be ensured through dedicated energy management.

References

EUOFFICIALJOURNAL (2020), *https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32020R0852&from=EN*. [2]

European Commission (2020), *https://ec.europa.eu/eurostat/ramon/nomenclatures/index.cfm?TargetUrl=LST_NOM_DTL&StrNom=CL_CEPAREM&StrLanguageCode=EN&IntPcKey=&StrLayoutCode=HIERARCHIC#:~:text=RAMON%20%2D%20Reference%20And%20Management%20Of%20Nomenclatures&text=Classification%20of%20Re*. [5]

European Commission (2020), *https://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Classification_of_environmental_protection_activities_(CEPA)*. [4]

EuropeanCommission (2018), *EC Regulation on the establishment of a framework to facilitate sustainable investment*, https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52018PC0353&from=EN. [1]

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OECD (2019), *Accelerating Climate Action: Refocusing Policies through a Well-being Lens*, OECD Publishing, Paris, https://dx.doi.org/10.1787/2f4c8c9a-en. [6]

Stiglitz, J., J. Fitoussi and M. Durand (2018), *Beyond GDP: Measuring What Counts for Economic and Social Performance*, OECD Publishing, Paris, https://dx.doi.org/10.1787/9789264307292-en. [3]

Notes

[1] Reference to Article 1 of the Regulation.

[2] Nomenclature des Activités Economiques dans la Communauté Européenne (NACE) is a European industry standard classification system which feeds into several EC economic and statistical systems, e.g. at Eurostat level.

[3] For example, by Eurostat

[4] Pages 85 to 95 of the TEG report contain an attempt of mapping of the stock of bonds and shares held by ECB against the taxonomy, also see table below. This study shows the significant proportion of financial products currently recorded under NACE codes “finance” and “services” in ECB databases. The taxonomy was developed for “real economy” sectors only and is therefore silent on those stocks, when the taxonomy is used this way.

[5] Funds subject to the EC’s regulatory framework for “Undertakings for the Collective Investment in Transferable Securities”.

[6] An Exchange Traded Fund (ETF) is a basket of securities that tracks an underlying index.

[7] Funds investing in any asset class excluding stocks, bonds, and cash.

[8] Based on the EU ETS benchmark for grey cement clinker. The threshold for cement clinker needs to be revised every time that there is an update in the EU ETS benchmark value for grey cement clinker.

[9] A detailed explanation of the threshold calculation is provided p 206 of the Technical Annex to the TEG final report on the EU taxonomy.

[10] The power density approach has been proposed to ease the administrative burden for conducting PCFs.

[11] https://www.hydropower.org/gres

[12] 250 as described in the ‘Guidelines for the Quantitative Analysis of Net GHG Emissions from Reservoirs’, issued in 2 volumes (Measurement Programmes & Data Analysis, and Modelling: Guidelines for Quantitaitve Analysis of Net GHG Emissions from Reservoirs)

[13] 252 Direct emissions of carbon dioxide (and to a lesser extent methane) result from the release of naturally occurring non-condensable gases (NCGs) from the geothermal fluid during the energy extraction process.

[14] A system is defined as the transmission or distribution network control area of the network or system operator(s) where the activity takes place. The European system shall be defined as the interconnected electricity system covering the interconnected control areas of EU Member States, Norway, Switzerland and the United Kingdom.

[15] Directive 2009/125/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for the setting of ecodesign requirements for energy-related products.

[16] See https://en.wikipedia.org/wiki/Allam_power_cycle

[17] Value of 0.5 according to the European benchmarking. Public Report IB2017 in https://www.waterbenchmark.org/documents/Public-documents

[18] The Infrastructure Leakage Index (ILI) is calculated as current annual real losses (CARL) / unavoidable annual real losses (UARL). See Canfora P., Antonopoulos I. S., Dri M., Gaudillat P., Schönberger H. (2019), "Best Environmental Management Practice for the Public Administration Sector". JRC Science for Policy Report EUR 29705 EN.

[19] For definition of fertilising products refer to ANNEX I of Proposed Regulation COM (2016) 157 laying down rules on the making available on the market of EU fertilising products, amending Regulations (EC) No 1069/2009 and (EC) No 1107/2009 and repealing Regulation (EC) No 2003/2003

[20] The European Green Deal, COM(2019) 640 final (include link)

[21] https://www.eea.europa.eu/themes/transport/term/increasing-oil-consumption-and-ghg

[22] Greenhouse gas emissions from transport:

https://ec.europa.eu/transport/facts-fundings/statistics/pocketbook-2019_en

[23] '"A Clean Planet for All". A European long-term strategic vision for a prosperous, modern, competitive and climate neutral economy'.https://ec.europa.eu/clima/sites/clima/files/docs/pages/com_2018_733_analysis_in_support_en_0.pdf.

[24] The European Green Deal, COM(2019) 640 final

[25] "A Clean Planet for All". A European long-term strategic vision for a prosperous, modern, competitive and climate neutral economy'. https://ec.europa.eu/clima/sites/clima/files/docs/pages/com_2018_733_analysis_in_support_en_0.pdf.

[26]At this stage, only criteria for inland waterway transport passenger and freight fleets are defined. The criteria for infrastructure could not be applied to non-zero direct emissions maritime shipping fleets until criteria for that type of activity is defined.

[27] https://ictfootprint.eu/en/about/ict-carbon-footprint/ict-carbon-footprint

[28] Cisco Annual Internet Report (2018-2023) – Updated on 28 February 2020 - https://www.cisco.com/c/en/us/solutions/collateral/executive-perspectives/annual-internet-report/white-paper-c11-741490.html

[29] EC JRC, Best Environmental Management Practice in the Telecommunications and ICT Services Sector, 2016 available at http://susproc.jrc.ec.europa.eu/activities/emas/documents/TelecomICT_BEMP_BackgroundReport.pdf

[30] The 2019 version is available at this link: https://e3p.jrc.ec.europa.eu/publications/2019-best-practice-guidelines-eu-code-conduct-data-centre-energy-efficiency

[31] https://ec.europa.eu/energy/en/topics/energy-efficiency/energy-performance-of-buildings

[32] https://ec.europa.eu/energy/en/eu-buildings-database

[33] Certain types of financial instruments such as loans for acquisition and renovation of buildings may need to consider acquisition costs integrally with the eligible renovation costs if these costs cannot be practically separated in those types of financial instruments.

[34] According to Article 9 of the EPBD, by 31 December 2020 all new buildings must be NZEB.

[35] 412 According to Article 7 of the Energy Performance in Buildings Directive, buildings undergoing major renovation must meet the cost-optimal minimum energy performance requirements.

[36] The PED is either directly expressed by NZEB requirements or is derived by applying those requirements and calculating the resulting PED. When NZEB requirements specify a PED, the percentage improvement should be applied to this figure.

[37] As defined in national methodologies developed by EU Member States to implement the EPBD.

[38] International Property Measurement Standards (IPMS): https://ipmsc.org/

[39] Major renovation' means the renovation of a building where:

(a) the total cost of the renovation relating to the building envelope or the technical building systems is higher than 25 % of the value of the building, excluding the value of the land upon which the building is situated; or

(b) more than 25 % of the surface of the building envelope undergoes renovation. Member States may choose to apply option (a) or (b).

[40] The 30% improvement must result from an actual reduction in primary energy demand (i.e. reductions in net primary energy demand through renewable energy sources do not count), and can be achieved through a succession of measures within a maximum of 3 years.

[41] International Property Measurement Standards (IPMS): https://ipmsc.org/

[42] Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH)