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Environmental performance evaluation — Green debt instruments —

Part 3: Taxonomy

Évaluation de la performance environnementale — Titres de créance verts —

Partie 3: Taxinomie

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 207, *Environmental management*, Subcommittee SC 4, *Environmental performance evaluation*.

A list of all parts in the ISO 14030 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

This document provides a taxonomy of eligible projects, assets and supporting expenditures for use by issuers and originators of green debt instruments. Projects, assets and supporting expenditures included in this document are assumed to be eligible as long as any specific thresholds or criteria are met and any applicable exclusions are respected. The taxonomy addresses sector criteria, rationale for eligibility, potential environmental benefits and environmental performance indicators.

NOTE In this document, the wording "projects, assets and supporting expenditures" used together or individually has the same meanings and covers all projects, assets and supporting expenditures financed by a bond, a loan or other debt instrument.

The objective of the taxonomy is to identify projects, assets and supporting expenditures that contribute to one or more environmental objectives, while doing no significant harm (DNSH) to other environmental objectives. Issuers, borrowers or lenders are informed by:

a) the taxonomy of eligible projects, assets and supporting expenditures that are anticipated to contribute to climate change mitigation, including guidance on DNSH assessments (see Clause 5);

b) guidance on climate change adaption by economic sector (see Annex A);

c) examples of thresholds and exclusions that may be applied to specific economic sectors (see Annex B);

d) guidance on other suitable taxonomies (see Annex C).

Users of this document can apply threshold values and exclusions identified in the taxonomy in Annex B or the taxonomy selected by the user (see ISO 14030-1:2021, 5.1, and ISO 14030-2:2021, 5.1). If a different taxonomy is used, threshold values are explained and justified.

Subclause 5.4 provides sector examples for the taxonomy nominated projects, assets and supporting expenditures.

This document encourages the mitigation and adaptation pathway forward to contribute to a low-carbon and resilient society. Economic activities can themselves contribute to environmental objectives or can enable other activities to contribute to environmental objectives.

Within the taxonomy, eligible investment categories and subcategories are either:

— economic activities that can be decarbonized or that support decarbonization; or

— projects, assets and supporting expenditures that can enable improved environmental performance in another economic activity and are performed to avert a substantial negative impact on the environment.

The taxonomy facilitates decision-making on what economic activities are sustainable, with the aim of helping investors to identify sustainable investment opportunities. It is intended that the green taxonomy presented in this document will serve as a holistic tool that captures all relevant environmental objectives. Although most requirements relate to climate mitigation or climate adaptation, this document addresses other environmental aspects, issues and objectives relevant to each included sector.

This document recognizes that all sectors must become more climate resilient to achieve adaptation objectives and avoid maladaptation. As a result, the adaptation approach is a set of guiding principles and qualitative screening criteria which can be applied in any sector. However, to be included in the taxonomy, an economic activity must also avoid significant harm to the six other environmental objectives (see 5.3).

This document recognizes that all sectors must become more climate resilient. As a result, the do no significant harm (DNSH) section of each table in the taxonomy includes a set of considerations for addressing issues related to the eligible project and asset categories.

To provide guidance for projects, assets and supporting expenditures that are being financed with the specific purpose of promoting adaptation, this document includes guidance for adaptation by sector in Annex A.

This document defines sector categories or subcategories and describes the rationale for their inclusion in the taxonomy. It provides examples of thresholds and exclusions in Annex B.

Different types of finance support projects, assets and supporting expenditures that contribute to environmental or sustainable development objectives. In this taxonomy, debt instruments may either finance the acquisition, manufacture, development, distribution, operation and maintenance or refinance the listed projects, assets and supporting expenditures. The taxonomy provides a framework for classifying all potential projects, assets or supporting expenditures against a comprehensive set of environmental objectives. In addition, all eligible projects, assets and supporting expenditures have to consider the state of the local environment.

The objective of the taxonomy is to identify activities with positive environmental benefits.

It may be used as a separate resource or by users of ISO 14030-1 and ISO 14030-2 who can:

— select this document as their taxonomy and refer to its tables when establishing environmental performance indicators;

— adopt thresholds and exclusions detailed in Annex B.

This document requires issuers to evaluate and avoid harm to related environmental aspects.

The taxonomy focuses on activities within sectors. For this reason, environmental aspects are evaluated at the level of projects and assets. If buildings or materials are needed to finance the projects and assets, the evaluation is made at the level of the different potential environmental aspects, taking into account the life cycle perspective, including all upstream and downstream resource flows.

The taxonomy's objective is to identify eligible projects, assets and supporting expenditures. Users of this document, or of another appropriate taxonomy, will obtain greater confidence that interested parties will consider financed projects, assets and supporting expenditures to be green.

To substitute high carbon intensity processes, some technologies can be implemented. The best available option should be taken in light of various circumstances of countries and regions.

Users of this document can adopt:

— thresholds and exclusions from Annex B;

— local, regional or international regulations;

— provisions found in other taxonomies.

Figure 1 outlines the relationship between the four parts of the ISO 14030 series.

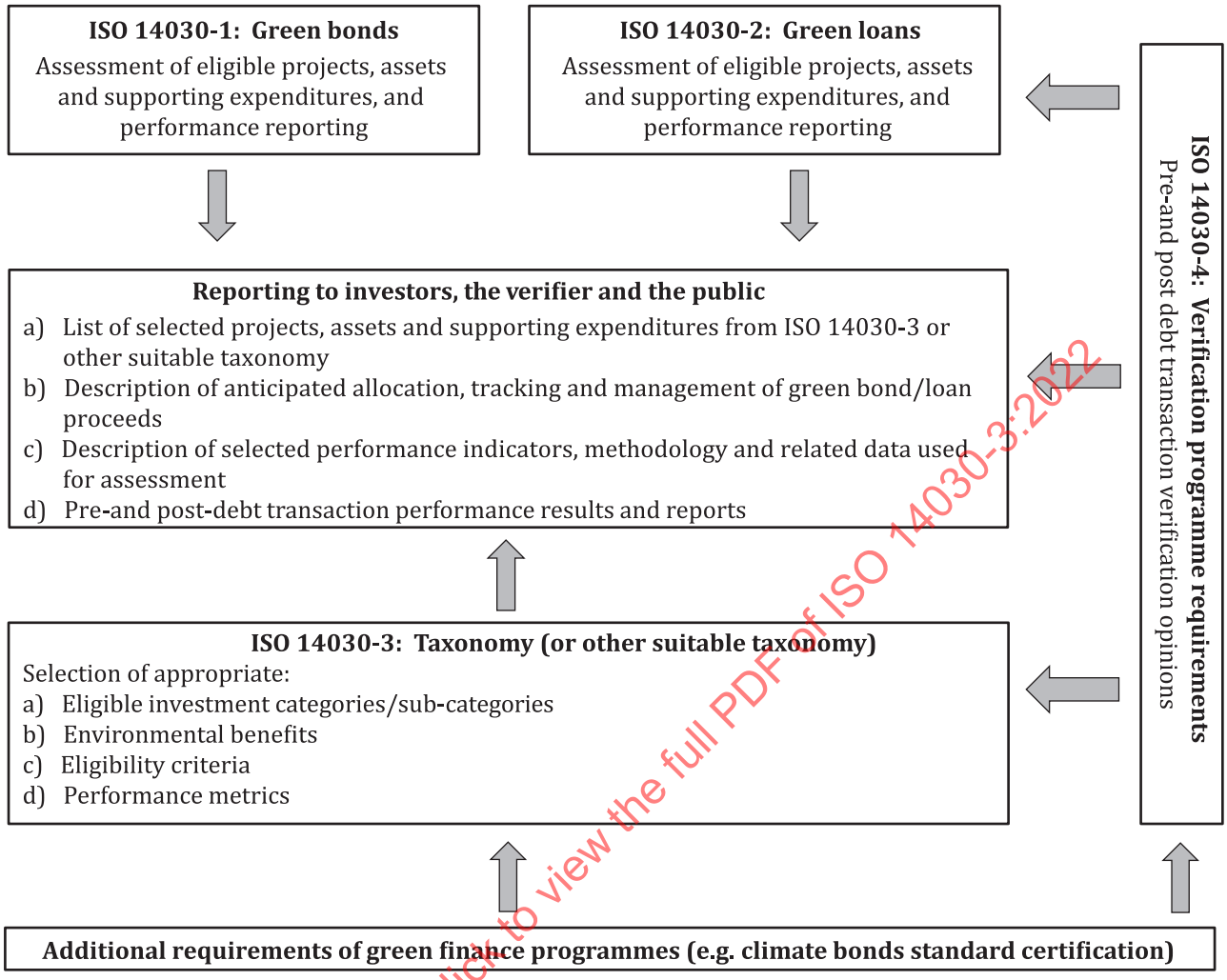

Figure 1 — Relationship between the parts of the ISO 14030 series

Environmental performance evaluation — Green debt instruments —

Part 3: Taxonomy

1 Scope

This document defines a taxonomy of eligible investment categories for designation as green debt instruments, including bonds and loans.

This document categorizes economic sectors and establishes criteria for determining the eligibility of projects, assets and supporting expenditures. It provides guidance on adaptation by sector in Annex A. It provides examples of thresholds and exclusions in Annex B.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 13065, *Sustainability criteria for bioenergy*

ISO 14030-1:2021, *Environmental performance evaluation — Green debt instruments — Part 1: Process for green bonds*

ISO 14030-2:2021, *Environmental performance evaluation — Green debt instruments — Part 2: Process for green loans*

ISO 14064-2, *Greenhouse gases — Part 2: Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emission reductions or removal enhancements*

ISO 14067, *Greenhouse gases — Carbon footprint of products — Requirements and guidelines for quantification*

International Finance Corporation (IFC) Performance Standard 6, *Biodiversity Conservation and Sustainable Management of Living Natural Resources*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 14030-1, ISO 14030-2 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1.1 Terms related to economy and finance

3.1.1.1
debt instrument
obligation that enables a party to raise funds by promising to repay a *lender* (3.1.1.5) in accordance with the terms of a contract

3.1.1.2
green debt instrument
debt instrument (3.1.1.1) whose net proceeds or an amount equivalent to the net proceeds will be exclusively applied to finance or re-finance in part or in full new or existing eligible projects, assets and supporting expenditures

3.1.1.3
issuer
entity responsible for fulfilling the contractual obligations of the bond or other *debt instrument* (3.1.1.1)

3.1.1.4
borrower
person or company who has contracted a loan

3.1.1.5
lender
institution or other entity that makes funds available to a *borrower* (3.1.1.4) with the expectation that those funds will be repaid

Note 1 to entry: In the context of this document, the term "lender" is generic and includes all financial organizations who make loans to individuals, small- and medium-sized enterprises, independently to the investees.

Note 2 to entry: "Lenders" may include chartered banks, insurance companies, cooperative banks, crowdfunding companies, revolving credit companies, Islamic banks, individuals and solidarity-based finance providers.

3.1.2 Terms related to the environment

3.1.2.1
environment
surroundings in which an organization operates, including air, water, land, natural resources, flora, fauna, humans and their interrelationships

Note 1 to entry: In this document, the phrase "in which an organization operates" should be understood as "inherent to or affected by the eligible projects, assets or supporting expenditures associated with the *green debt instrument* (3.1.1.2)".

[SOURCE: ISO 14001:2015, 3.2.1, modified — Notes 1 and 2 to entry have been deleted and a new Note 1 to entry has been added.]

3.1.2.2
ecosystem
dynamic complex of plant, animal and micro-organism communities, and their non-living *environment* (3.1.2.1) interacting as a functional entity

EXAMPLE Deserts, coral reefs, wetlands, rain forests, boreal forests, grasslands, urban parks, cultivated farmlands.

Note 1 to entry: Ecosystems can be influenced by human activity.

[SOURCE: ISO 14008:2019, 3.1.6]

3.1.2.3
ecosystem service
benefit people obtain from *ecosystems* (3.1.2.2)

Note 1 to entry: These are generally distinguished into provisioning, regulating, supporting and cultural services. Ecosystem services include the provisioning of goods (e.g. food, fuel, raw materials, fibre), regulating services (e.g. climate regulation, disease control), and non-material benefits (cultural services) (e.g. spiritual or aesthetic benefits). The supporting services are necessary for the production of all other ecosystem services (e.g. soil formation, nutrient cycling, water cycling) and are also referred to as "ecosystem functions".

Note 2 to entry: Ecosystem services are sometimes called "environmental services" or "ecological services".

[SOURCE: ISO 14008:2019, 3.2.11]

3.1.2.4
protected area
geographically defined area which is designated or regulated and managed to achieve specific conservation *objectives* (3.1.4.1)

3.1.3 Terms related to environmental impacts

3.1.3.1
impact
result of a change or existing condition that may be adverse or beneficial

[SOURCE: ISO 15392:2019, 3.17, modified — "neutral" has been deleted after "adverse".]

3.1.3.2
environmental impact
impact (3.1.3.1) to or conservation of the *environment* (3.1.2.1), wholly or partially resulting from eligible projects, assets or supporting expenditures

3.1.3.3
environmental benefit
gain related to the *environment* (3.1.2.1)

Note 1 to entry: A positive effect on the environment that protects or restores natural habitats or *ecosystems* (3.1.2.2), or mitigates further environmental harm.

[SOURCE: ISO 14050:2020, 3.12.2, modified — "internal and external" has been deleted from before "gain". Note 1 to entry has been added.]

3.1.3.4
indicator
quantitative, qualitative or binary variable that can be measured or described, representing the status of operations, management, conditions or *impacts* (3.1.3.1)

[SOURCE: ISO 14031:2021, 3.4.1]

3.1.3.5
environmental performance
performance related to the management of environmental aspects

[SOURCE: ISO 14001:2015, 3.4.11, modified — Note 1 to entry has been deleted.]

3.1.3.6
environmental performance indicator
EPI
indicator (3.1.3.4) that provides information about an organization's *environmental performance* (3.1.3.5)

Note 1 to entry: In this document, "organization" refers to an eligible project, asset or supporting expenditure.

[SOURCE: ISO 14031:2021, 3.4.5, modified — Note 1 to entry has been added.]

3.1.4 Terms related to environmental management

3.1.4.1
objective
result to be achieved

[SOURCE: ISO 14001:2015, 3.2.5, modified — The notes to entry have been deleted.]

3.1.4.2
environmental objective
objective (3.1.4.1) that relates to the *environment* (3.1.2.1) that is associated with eligible projects, assets and supporting expenditures

3.1.4.3
prevention of pollution
use of *processes* (3.1.4.8), practices, techniques, materials, products, services or energy to avoid, reduce or control (separately or in combination) the creation, emission or discharge of any type of pollutant or waste, in order to reduce adverse *environmental impacts* (3.1.3.2)

Note 1 to entry: Prevention of pollution can include source reduction or elimination, process, product or service changes, efficient use of resources, material and energy substitution, reuse, recovery, recycling, reclamation and treatment.

[SOURCE: ISO Guide 64:2008, 2.7]

3.1.4.4
BAT
best available technique
best available technology
commercially available technology that is recognized by relevant authorities to reduce negative *environmental impacts* (3.1.3.2), including CO_2 emissions

Note 1 to entry: In some countries and regions, regional or country-based BAT directories authorized by regional/national governments or relevant authorities are available for the manufacturing sector.

3.1.4.5
circular economy
economy that is restorative and regenerative by design, and which aims to keep products, components and materials at their highest utility and value at all times, distinguishing between technical and biological cycles

[SOURCE: ISO 20400:2017, 3.1]

3.1.4.6
climate change mitigation
mitigation
human intervention to reduce greenhouse gas (GHG) emissions or enhance GHG removals

[SOURCE: ISO 14080:2018, 3.1.2.1, modified — The preferred term “mitigation” has been added, and “to reduce greenhouse gas (GHG) emissions or enhance GHG removals” has replaced “to reduce the sources or enhance the sinks of greenhouse gases (GHGs)”.]

3.1.4.7
monitoring
determining the status of a system, a *process* (3.1.4.8) or an activity

[SOURCE: ISO 14001:2015, 3.4.8, modified — Note 1 to entry has been deleted.]

3.1.4.8
process
set of interrelated or interacting activities which transforms inputs into outputs

[SOURCE: ISO 14001:2015, 3.3.5, modified — Note 1 to entry has been deleted.]

3.1.4.9
taxonomy
classification with sector criteria and a rationale for eligibility based on potential *environmental benefits* (3.1.3.3) and *environmental performance indicators* (3.1.3.6) for the described projects, assets and supporting expenditures

3.1.4.10
adaptation to climate change
climate change adaptation
adaptation
process of adjustment to actual or expected climate and its effects

Note 1 to entry: In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities.

Note 2 to entry: In some natural systems, human intervention can facilitate adjustment to expected climate and its effects.

[SOURCE: ISO 14090:2019, 3.1, modified — The preferred term "adaptation" has been added.]

3.1.4.11
certification scheme
certification system related to specified products, to which the same specified requirements, specific rules and procedures apply

Note 1 to entry: The rules, procedures and management for implementing product, process and service certification are stipulated by the certification scheme.

[SOURCE: ISO/IEC 17067:2013, 3.2]

3.2 Abbreviated terms

BAT	best available technology/best available technique
CATC	Clean Air Technology Center
CCS	carbon capture and storage
CHP	combined heat and power
CoP	coefficient of performance
CSP	concentrated solar power
DNSH	do no significant harm
EIA	environmental impact assessment
GHG	greenhouse gas
GWP	global warming potential
KBA	key biodiversity area
LCA	life cycle assessment

MSC	Marine Stewardship Council
NEDC	New European Driving Cycle
PV	Photovoltaic
SFM	sustainable forest management
T&D	transmission and distribution
WLTP	Worldwide Harmonised Light Vehicle Test Procedure

4 Principles

4.1 Precautionary principle

Significant risks to the environment, natural habitats, biodiversity, and human health and welfare are avoided, reduced and mitigated.

4.2 Evidence-based science

Methods utilize an evidence-based approach derived from peer reviewed scientific research.

4.3 Biodiversity protection

Land use activities that aim to offset carbon emissions improve environmental quality thereby promoting three types of biological diversity: genetic diversity, species diversity and ecosystem diversity. A healthy biodiversity effectively mitigates climate change.

Policies and resources are directed to promote biological diversity which comprises genetic diversity, species diversity and ecosystem diversity.

4.4 Life cycle perspective

A life cycle perspective is applied which considers all relevant stages of an activity's life cycle as well as a comprehensive set of environmental indicators.

5 Taxonomy

5.1 General

The taxonomy in this document covers the sector criteria, rationale for eligibility, potential environmental benefits and environmental performance indicators for the described projects, assets and supporting expenditures.

5.2 Use of the taxonomy

Users of this document shall apply thresholds and exclusions, in the form of numeric values, technical requirements or others. These can be those identified in Annex B or in a suitable taxonomy selected by the user.

The reason for using a suitable taxonomy other than this document should be explained and justified, e.g. by reference to national or regional legislation.

Guidance on the recognition of other suitable taxonomies is provided in Annex C.

Subclause 5.4 provides details on eligibility criteria used to determine whether nominated assets or projects are eligible to be funded by a green debt instrument (refer to ISO 14030-1:2021, 5.1) or a green loan (refer to ISO 14030-2:2021, 5.1).

Suggested impact reporting metrics shall be used for environmental performance reporting as set out in ISO 14030-1:2021, 8.2.2, and ISO 14030-2:2021, 6.5.4 and 7.5.4.4.

NOTE The content identified in 5.4 is not exhaustive.

5.3 Environmental and social evaluation

Issuers, borrowers or lenders shall evaluate projects, assets and supporting expenditures against one or more environmental objectives taking into account the precautionary principle (see 4.1), also referred to as "DNSH". Users of this document shall determine whether the projects, assets or supporting expenditures will do significant harm to any of the six environmental objectives:

a) climate change mitigation;

b) climate change adaptation;

c) sustainable use and protection of water and marine resources;

d) transition to a circular economy, waste prevention and recycling;

e) control and prevention of pollution;

f) protection and restoration of ecosystems and biodiversity.

The evaluation should determine whether the projects, assets or supporting expenditures would lead to the displacement of indigenous people or impact their historical lands. The projects, assets or supporting expenditures should also not infringe upon workers' rights under the International Labour Organization (ILO). If the evaluation identifies such impacts, the project, asset or supporting expenditures shall not be considered eligible.

NOTE Minimum social safeguards are defined in the principles and rights set out in the eight fundamental conventions identified in the ILO's Declaration on Fundamental Rights and Principles at Work[25].

The taxonomy should apply a life cycle perspective to reflect the environmental impact of manufacturing activities. This approach should consider, where applicable, the sourcing of raw materials, the use of renewable or recycled materials and end-of-life recycling, processing and manufacturing, any relevant transportation, and the end-of-life fate of the waste materials, co-products or final product, whether this is recovery, reuse, remanufacture, recycling or disposal. In addition, the use stage should be considered where appropriate. For each of the life cycle stages and environmental impacts, unintended consequences should be avoided, whereby the impact is shifted from one stage to another or to another environmental impact. Unintended consequences regarding depletion of energy or mineral resources, or other environmental impacts that arise in the course of a transition shall be addressed by the DNSH criteria (see 5.4).

Climate change mitigation shall be assessed for each activity for the sector activities given in this document, and the issuer shall document the DNSH of the other environmental aspects.

See Annex A for guidance on addressing the objective "climate change adaptation".

5.4 Classification of activities within sectors and subsectors

5.4.1 Agriculture, forestry and fishing

5.4.1.1 General

The sector includes:

— growing of perennial and non-perennial crops;

— fisheries;

— organic farms;

— afforestation/rehabilitation, restoration/reforestation and improved forest management.

5.4.1.2 Agriculture

General requirements for projects, assets and supporting expenditures in this sector include the following:

— Demonstration of conformity with applicable management practice criteria (e.g. a farm sustainability management plan which describes the management practices being deployed, taking into account crop husbandry requirements, farm pedo-climatic conditions and their coverage on the farm).

— Establishment of a carbon stock and GHG emissions baseline for the farm, against which carbon stock and GHG emission changes can be measured and compared.

— Performance of a carbon audit to assess where action is needed. A carbon management plan shall set out the management practices that will deliver the expected net GHG emissions reduction/carbon sequestration.

— A carbon management plan that is part of a farm's broader sustainability plan.

5.4.1.3 Forestry

The scope of this sector emphasizes carbon storage in forest ecosystems through forest management activities including harvesting. The selected activities represent interventions at different stages of a forest's economic life cycle, which include:

— afforestation;

— reforestation;

— restoration/rehabilitation;

— existing forest management.

The transfer from "afforestation" or "reforestation" criteria to the criteria set for existing forest management follows a sustainable management system as soon as possible.

The taxonomy sets out the following cumulative qualitative and quantitative mitigation criteria to be implemented, which shall result in GHG sequestration and soil and biodiversity maintenance or improvement.

a) Conformity with SFM requirements which is defined as "the stewardship and use of forests and forest lands in a way, and at a rate, that maintains their biodiversity, productivity, regeneration capacity, vitality and their potential to fulfil, now and in the future, relevant ecological, economic and social functions, at local, national, and global levels, and that does not cause damage to other ecosystems".

b) The establishment of a GHG inventory baseline for carbon pools.

c) The demonstration of permanent and steady progress shall be reported through a forest management plan (or equivalent) at 10-year intervals. Carbon stocks shall increase or be maintained in relation to the carbon baseline over a period of 20 years or the criteria established in nationally or internationally recognized protocols, e.g. VCS/VERRA or under the UNFCCC.

d) In some cases, fire is used as a management practice which increases plant species diversity (consider fire-adapted plants). Likewise, it leads to formation of carbon black which increases the stock of soil carbon.

5.4.1.4 Agriculture, forestry and fishing areas

The taxonomy for other agriculture, forestry and fishing is given in Tables 1 to 4.

Table 1 — Growing of perennial and non-perennial crops

Sector classification and activity	
Macro-sector	Agriculture, forestry and fishing
Description	Growing of perennials including grapes, tropical and sub-tropical fruits, citrus fruits, stone fruits, other tree and bush fruits and nuts, oleaginous fruits, beverage crops, spices, aromatics and drug and pharmaceutical crops. Growing of non-perennial crops including cereals, upland and paddy rice, leguminous crops and oil seeds, vegetables, melons, roots and tubers, sugar cane and fibre crops. Wetlands, namely land that is covered with or saturated by water permanently or for a significant part of the year, excluding paddy fields. This classification can be applied to finance the transition from common practice agriculture activities to organic farms and forests.
Sector criteria	
Potential environmental benefits	Growing of perennial crops: It is recognized that CO_2 sequestration represents the largest mitigation potential available to the agriculture sector at global scale, while emission savings of non-CO_2 emissions can be more important. Growing of non-perennial crops: Key environmental aspects to be considered for investments in growing of non-perennial crops span across all other five objectives and are summarized as: — the ability of farming systems to adapt to a changing climate; — the impact on water quantity, water quality and water ecosystems; — the impact on air quality; — inefficiencies in the production system including nutrient management; — pollutant and nutrient run-off and leaching; — impacts on habitats and species (e.g. through conversion of areas, intensification of existing arable land, and invasive alien species); — avoidance or reduction of net GHG emissions from production and related practices; — maintenance of existing sinks and increased sequestration (up to saturation point) in above- and below-ground carbon stocks;

Table 1 *(continued)*

	— avoidance, reduction and management of the use of agricultural chemicals; — avoidance, reduction and management of fertilizer; — management of water consumption and wastewater; — management of waste materials.
Environmental performance indicators	Environmental performance indicators can include the following: — Area over which essential management practices are deployed on the farm (%). — Per cent reduction in net GHG emissions (gCO_2e) over a specified period, compared to emissions at the start of that period. — Absolute GHG emissions compared to average within the same sector. — Increasing carbon stock (tC/ha) over a specified period. For soils specifically, where saturation levels have been reached, no further increase in carbon content is expected. In this case, existing levels should be maintained. The indicator for GHG emissions is gCO_2e. Using relative GHG indicators (i.e. % change in gCO_2e/ha or % change in gCO_2e/unit of production) is possible, where these can be made relative to a counterfactual on the same farm or project. — Area over which agriculture chemicals and fertilizer management are deployed on the farm (%). — Amount or percentage of reduction of the purchasing, and use of agriculture chemicals and fertilizer (%). — Water consumption (m^3) or water use intensity (m^3/ha), considering water scarcity of the locality. — Wastewater (m^3). — Amount or percentage of reduction of waste materials (%).
Rationale	
Growing of perennial crops: In the context of agriculture, low-carbon is a means to ensure that even where net GHG emissions cannot be reduced to zero, they can be compensated through increased removals (through carbon sequestration) on farmed land. It is not always possible to achieve a low-carbon economy on an individual farm in all cases, particularly where they specialize. In other cases, it can be more feasible. Furthermore, one opportunity for emission reductions in the agriculture sector as a whole is to switch from higher emitting activities to lower emitting activities (e.g. reducing cattle numbers and increasing legume production as an alternative source of protein, increasing energy and nutrient recovery), with a corresponding consumption switch between agricultural commodities. GHG accounting at the farm level is helpful.	

Table 1 *(continued)*

Growing of non-perennial crops: In respect to non-perennial cropland production, key sources of emissions are emissions associated with soil management and the application of fertilizers, methane emissions from rice cultivation, and avoided emissions embedded in crop waste. With respect to management practices that substantially mitigate GHG emissions: a) there is sufficient existing scientific knowledge and consensus on the mitigation effects and interactions with other environmental and food security objectives; b) the scale, certainty and consistency of mitigation effects is sufficiently demonstrated. Agricultural biomass and cover crop yields are delivered to processors for conversion to fuels and chemicals.	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under "sector criteria" above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation (see Clauses A.1 and A.2).
(3) Water	Activities should not lead to a decrease in: — water availability in catchments where this is a concern and should be in line with the objective to maintain adequate water levels; — water quality within a catchment area should be in keeping with the objective of good chemical and ecological status.
(4) Circular economy	Activities should minimize: — waste or losses from the production or harvesting of crops, in line with good agricultural practice; — raw material uses per unit of output, including energy; — the loss of nutrients from the production system; — the impacts on other local activities, including recreation or education.
(5) Pollution	— Activities that ensure the protection of soils to prevent erosion and run-off into water courses/bodies and to maintain soil organic matter. — Activities do not lead to the conversion, fragmentation or unsustainable intensification of high-nature-value farmland, wetlands, forests or other areas of high-biodiversity value.
(6) Ecosystems	Activities should not: — result in a decrease in the diversity or abundance of species and habitats of conservation importance or concern; — fail to comply with existing management plans or conservation objectives. Where activities involve the production of novel non-native or invasive alien species, their cultivation should be subject to an initial risk assessment and ongoing monitoring in order to ensure sufficient safeguards are in place to prevent escape into the environment.

Table 2 — Fisheries

Sector classification and activity	
Macro-sector	Agriculture, forestry and fishing
Description	Fisheries
Sector criteria	
Potential environmental benefits	Preserve fisheries based on sustainable criteria [such as the Marine Stewardship Council (MSC) sustainable fishery label, the Aquaculture Stewardship Council (ASC), Best Aquaculture Practices (BAP), Global Good Agricultural Practices (GGAP) and Marine Eco-Label Japan (MEL)]. Reduce energy consumption in fishing fleets using hybrid wind/motor propulsion systems. Use renewable energy (wind, solar and ocean energy). Potential negative impacts: — food insecurity; — impact on fishermen's livelihoods.
Environmental performance indicators	Environmental performance indicators can include: — CO_2e per tonnes of fish sold; — sustainable fisheries management label; — extent to which the fishery is maintained on a self-sustaining basis.
Rationale	
Wild production, based on sustainable criteria defined in programmes such as: The Marine Ingredients Organisation (IFFO), Alaska Seafood Marketing Institute (ASMI), Responsible Fisheries Management (RFM), Iceland Responsible Fisheries, Fair Trade USA, and MEL (Marine Eco-Label Japan); or if it is under full assessment in the MSC programme; or if it is in a fishery improvement project (FIP) that is making good progress (i.e. with a progress rating of A, B, or C using the Sustainable Fisheries Partnership's FIP evaluation tool). Farmed production: certified by one of the following programmes: Aquaculture Stewardship Council (ASC), Best Aquaculture Practices (BAP), Global Good Agricultural Practices (GGAP); or if it is in a formal aquaculture improvement project (AIP).	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under "sector criteria" above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.
(3) Water	Minimize risks related to local water quality or local water consumption.
(4) Circular economy	Ensure appropriate measures are in place to minimize and manage waste, energy and material use in construction, maintenance and decommissioning phases.
(5) Pollution	Avoid eutrophication of water bodies and leakage of hazardous substances.
(6) Ecosystems	For planning and constructing infrastructure in a protected area, or which includes activities outside a protected area but likely to have a significant negative impact on its biodiversity, ensure that an appropriate assessment based on the conservation objectives of the protected area has been conducted in compliance with one of the following: — International Finance Corporation (IFC) Performance Standard 6, *Biodiversity Conservation and Sustainable Management of Living Natural Resources*; — an equivalent national standard. For such operations, ensure that a site-level biodiversity management plan exists and is implemented.

Table 3 — Organic farms

Sector classification and activity	
Macro-sector	Agriculture, forestry and fishing
Description	Organic farms
Sector criteria	
Potential environmental benefits	Avoid or reduce net 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. Sustainably high microbial population, prevention of leaching. Demonstrate the use of compost for soil. Demonstrate agricultural production using soil, not hydroponics or rock wool cultivation. Demonstrate no use of banned agriculture chemicals from the specific period of years before sowing or planting. Demonstrate avoidance, reduction and management in the use of agriculture chemicals. Demonstrate avoidance, reduction and management of fertilizer. Demonstrate no use of genetic recombination technology, where applicable.
Environmental performance indicators	Environmental performance indicators can include: — proportion of the livestock operation for which mitigation practices are deployed (%); — per cent reduction in net GHG emissions (gCO_2e) over a specified period, compared to emissions at the start of that period; — area over which appropriate management practices are deployed on the organic farm (%); — increasing carbon stock (tC/ha) over a specified period; — number of native species and their populations during the period when organic farming is operated.
Rationale	
Opportunities for substantial mitigation and contributions to a net zero-carbon economy An overarching goal of the taxonomy is to enable it to be consistent with the underlying goal of a net zero-carbon economy by 2050. The objective for this sector is to reduce net GHG emissions from farming practices and management, including cropland management, grazing land management, restoration of cultivated organic soils and restoration of degraded lands. Three annual compliance checks are proposed to ensure progress is being made and mitigation is being delivered in practice, and also to reduce the burden necessary on operators. This compliance checking is required for management practice checking, carbon stock change and GHG reductions. To prepare a farm sustainability management plan, a carbon calculator can be used, or the plan can also be prepared using other nutrient decision-support tools. The reduction in net GHG emissions (gCO_2e) is in line with the following trajectory: — essential management practices are deployed consistently over the applicable livestock operation or permanent grassland area each year; — above- and below-ground carbon stocks increase progressively over a 20-year period.	

Table 3 *(continued)*

For soils specifically, where saturation levels have been reached, no further increase in carbon content is expected. In this case, existing levels should be maintained. Presence or absence supporting notes: — To demonstrate conformity with the essential management practices criteria, it will be necessary to establish a farm sustainability management plan which describes the management practices being deployed and their coverage on the farm. — A carbon audit is necessary in order to also assess where action is needed, and this shall be accompanied by a carbon management plan to set out the management practices that will deliver net GHG emission reductions and carbon sequestration. — This carbon management plan is part of the broader farm sustainability plan. Emissions, sinks and management practices are all to be audited at three-year intervals to confirm ongoing conformity with these requirements.	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under "sector criteria" above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation
(3) Water	Minimize risks related to local water quality or local water consumption.
(4) Circular economy	Ensure appropriate measures are in place to minimize and manage waste, energy and material use in construction, maintenance and decommissioning phases.
(5) Pollution	Avoid substances that cause eutrophication of water bodies or pollute the soil.
(6) Ecosystems	For planning and constructing infrastructure in a protected area, or which includes activities outside a protected area but likely to have a significant negative impact on its biodiversity, ensure that an appropriate assessment based on the conservation objectives of the protected area has been conducted in compliance with one of the following: — IFC Performance Standard 6, *Biodiversity Conservation and Sustainable Management of Living Natural Resources*; — an equivalent national standard. For such operations, ensure that a site-level biodiversity management plan exists and is implemented.

Table 4 — Afforestation/rehabilitation, restoration/reforestation/existing forest management

Sector classification and activity	
Macro-sector	Agriculture, forestry and fishing
Description	Afforestation is the establishment of forest through planting or deliberate seeding on land that, until then, was under a different land use. It implies a transformation of land use from non-forest to forest. Restoration and rehabilitation are any intentional activity that initiates or accelerates the recovery of an ecosystem from a degraded state. Reforestation is the re-establishment of forest through planting or deliberate seeding on land classified as forest. It implies no change of land use, includes planting/seeding of temporarily unstocked forest areas as well as planting/seeding of areas with forest cover. It includes coppice from trees that were originally planted or seeded. It excludes natural regeneration of forest. In the context of the taxonomy, the category "reforestation" applies in cases following extreme events (wind throws, fires, etc.), and not as part of a normal, legally binding obligation to reforest after harvesting. Existing forest management shall maintain or increase carbon stocks of above- and below-ground carbon over time.

Table 4 *(continued)*

Sector criteria	
Potential environmental benefits	Afforestation increases carbon stocks of above- and below-ground carbon overall compared to a counterfactual with no conversion to forest. Restoration and rehabilitation maintains or increases carbon stocks of above- and below-ground carbon. Reforestation increases overall carbon stocks of above- and below-ground carbon. SFM criteria include: — identify and apply forest management practices that increase or maintain existing carbon stocks from above- and below-ground carbon overall, while maintaining or improving the soil quality, and biodiversity; — maintain or improve the long-term capacity of the forest to deliver multiple services (e.g. ecosystem services, timber production); — do not convert high carbon stock land (i.e. primary forest, peatlands, wetlands, grasslands) which has this status on or before January 2008; — regenerate harvested forests. Other criteria are as follows: — Establish a baseline GHG inventory of carbon pools at the beginning of the afforestation/reforestation activity. — Demonstrate continued conformity with the SFM requirements and increase or maintain carbon sinks from above-ground carbon over time, supported by and disclosed through a forest management plan (or equivalent) at five-year intervals. Methods to demonstrate conformity with SFM requirements include self-declarations provided by the organization, second party assessments conducted by interested parties and certification by a third party. Organizations using the ISO 14030 series should determine which level of conformity assessment is suitable to their needs. All the criteria apply together.
Environmental performance indicators	SFM criteria as described above. GHG inventory baseline is calculated for above-ground carbon pools, based on the "gain-loss" or on the "difference of carbon stocks" for species per m^3/year/ha, carbon convertible. NOTE Calculating the GHG inventory baseline requires knowledge of the area, the species and the number of trees (in case of planting). The increment based on the growth-yield curves gives the approximate number of how many m^3/year/ha are available for increment. The methodology is consistent with the approach in the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories[27].
Rationale	
Existing forests A substantial portion of forestry activities will fall under the bracket of existing forest management. Existing forest management is recognized in the taxonomy, provided it can demonstrate maintenance of high carbon stocks in multiple pools and overall improvement in forest carbon sinks. Forestry can deliver GHG emission mitigation and protect carbon storage through sequestration of carbon during tree growth. Carbon is fixed above ground and below ground in the vegetation, soil, litter and dead wood derived from the forest in line with the lifetime of these pools. The management of existing forests and forest rehabilitation activities can deliver substantial mitigation through: — an increase or maintenance in the forest capacity to sequestrate carbon from above-ground and below-ground carbon pools; — maintenance or increase of the soil quality, soil carbon and biodiversity.	

Table 4 *(continued)*

The approach taken to determine metrics relies on cumulative criteria: 1. SFM requirements that ensure the maintenance or increase of carbon sinks of above- and below-ground carbon through management practices. Above-ground carbon refers to shoot carbon, litter and dead wood, while below-ground carbon refers to root carbon. Soil carbon in severely burnt land also covers black carbon. 2. GHG measurement of sequestration in carbon pools. Calculating the GHG inventory baseline requires knowledge of the area, species and the number of trees (in the case of planting). Growth-yield curves provide the approximate increase of carbon stocks in m^3/year/ha. The methodology is consistent with the approach in the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories[27], which recommends recalculation of the amount of carbon sequestered; 1 tonne of biomass represents approximately 0,5 tonnes of carbon. Further, 1 tonne of carbon equals 3,67 tonnes of carbon dioxide. Land use, land-use change and forestry (LULUCF)-compliant country-level reporting or landscape management-level reporting may be used to emphasize that the goal can be to perform at a scale above the single forest stand. Absence of landscape management access will in turn require disclosure at the single forest stand. The forest taxonomy allows forest owners and companies to explain and document on which level they report. 3. Demonstration of permanence and performance. Demonstration of permanence and steady progress with respect to criteria 1 and 2 is reported through a forest management plan (or equivalent) at five-year intervals. Considering the impact of climate conditions and changing environments, underperformance resulting from natural disturbance (*force majeure*) can be excluded from impacting the achievement of the thresholds and will not result in nonconformity with taxonomy criteria.	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
Key environmental aspects span across all other five objectives and are summarized as: — the ability of forests to adapt to a changing climate; — the impact on water resources as well as on water quality; — the pollution to water, air and soil, and the risks associated from the use of pesticides and fertilizers; — the impact on biodiversity and ecosystems from intensive cultivation; — the conversion of land of high ecological value to forests and illegal logging. The DNSH criteria should be considered in combination with SFM requirements. Organizations using this document should determine which level of conformity assessment is suitable to their particular needs. Conformity may be documented in a forest management plan (or equivalent).	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under “sector criteria” above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation (see Clauses A.3 and A.4).
(3) Water	Identify, disclose and address any water-related risks (e.g. in relation to quality of discharges into watercourses, wetlands and quantitative impacts of water use on groundwater and surface water bodies).
(4) Circular economy	Not applicable

Table 4 *(continued)*

(5) Pollution	Minimize the use of pesticides and favour alternative approaches or techniques, such as non-chemical alternatives to pesticides, with the exception of occasions when this is needed to control pest and disease outbreaks. It is important to adapt the use of fertilizers to what is needed to prevent leeching of nutrients to waters. Well-documented and verifiable measures should be taken to avoid the use of active ingredients that are listed in the Stockholm Convention[33], the Rotterdam Convention[32], the Montreal Protocol on Substances that Deplete the Ozone Layer[31], or that are listed as Class Ia or Ib in the WHO recommended classification of pesticides by hazard[35]. Prevent pollution of water and soil in forests, and undertake clean-up measures when necessary. Choose trees and vegetation with low emissions of biogenic ozone precursors.
(6) Ecosystems	Take measures to ensure sustained or improved conservation status at the landscape level. In designated conservation areas, actions should be demonstrated to be in line with conservation objectives for those areas. No conversion of habitats specifically sensitive to biodiversity loss or of high conservation value such as grasslands and any high carbon stock area (e.g. peat lands and wetlands), and areas set aside for the restoration of such habitats. Develop a forest management plan (or equivalent) that includes provisions for zoning conservation areas, and for maintaining biodiversity. Evaluate ecosystem services with the aim to not decrease the amount and quality of ecosystem services provided. Monitor and protect forests to prevent illegal logging.

5.4.2 Manufacturing

5.4.2.1 Inclusion of manufacturing

Manufacturing is the second largest contributor to CO_2e emissions but is also able to produce the products and technologies that can contribute to net GHG emission reductions in other sectors of the economy. Thus, it is a fundamental part of the low-carbon economy.

5.4.2.2 Subjects covered

The economic activities covered in this document include both "greening of" and "greening by" activities. "Greening of" activities include the manufacturing of aluminium, iron and steel, cement and chemicals. These sectors account for a high share of industrial net GHG emissions and offer large potential for net GHG emission reductions in future new production processes and by use of these materials in low-carbon applications, which may be shown by LCA.

"Greening by" activities include the manufacturing of products, key components, equipment and machinery that are essential to a number of key renewable energy technologies (bioenergy, geothermal power, hydropower, CSP, solar PV technology, wind energy and ocean energy, low-carbon transport vehicles, fleets and vessels), and energy efficiency equipment for buildings and other low-carbon technologies that result in substantial GHG emission reductions in further sectors of the economy, including private households.

Due to the nature of manufacturing, and in order to undertake a proper systematic value chain approach in the taxonomy, close linkages have been made with the energy, transport, agriculture and building sectors. Where possible, circularity considerations in so far as they affect net GHG emissions and a broader value chain approach have been considered.

5.4.2.3 Sector criteria and thresholds

Issuers, borrowers and lenders should apply a life cycle perspective to better reflect the environmental impact of manufacturing activities to produce all materials – as well as their co-products – with qualitative or quantitative thresholds and exclusions applied (see Annex B or taxonomy otherwise selected by the user).

For "greening by" activities, this uncomprehensive list is complemented by additional criteria that allow any other product, component, equipment or technology to be considered eligible if the overall benefits in terms of net GHG emission reductions are proven by life cycle assessment or carbon footprinting (e.g. ISO 14040, ISO 14044 and ISO 14067).

For "greening of" activities, the criteria focus instead on reducing the net GHG emissions caused by manufacturing activities up to the levels of performance achieved by best performers. The criteria cover direct and indirect emissions (see ISO 14064-1).

Additionally, the taxonomy also supports the transition of economic activities in these high emitting sectors towards reaching the adopted thresholds. It recognizes expenditures in energy efficiency measures, process improvements and all other mitigation measures in these sectors as eligible if the measures support closing the gap between the current level of efficiency and the level considered "substantially contributing to mitigation objectives" as defined by the adopted thresholds.

In the manufacturing sector, it is difficult to avoid using fossil resources in certain processes. In those cases, the introduction of CCS technologies or BAT can be a feasible option. Additionally, if CCS enables an economic activity in the manufacturing sector to meet its screening criteria, the installation of CCS technology can be considered taxonomy-eligible once the screening criteria have been met. This also applies to overall economic activity. Carbon capture and utilization (CCU), where the captured CO_2 is utilized as a feedstock (e.g. for a chemical process), may also qualify if substantial mitigation impacts can be demonstrated by reducing emissions towards meeting the activity criteria (e.g. the use of CO_2 for enhanced oil extraction would not qualify).

Within the "greening by" and "greening of" activities, resource efficiency is also considered because it contributes to meeting the criterion of proving substantial emission reductions through life cycle assessment or carbon footprinting.

5.4.2.4 Manufacturing areas

The taxonomy for manufacturing is given in Tables 5 to 14.

Table 5 — Energy and resource efficiency common to manufacturing

Sector classification and activity	
Macro-sector	Manufacturing in general
Description	Energy and resource efficiency in manufacturing
Sector criteria	
Potential environmental benefits	Demonstrate substantial GHG emission reductions for both new and upgrades of existing industrial facilities and production processes through improvements in energy and resource efficiency or other mitigation measures. Implementation of defined BATs or energy efficiency technologies meeting high standards such as CHP, efficient compressed air, variable-speed drives, etc.
Environmental performance indicators	Environmental performance indicators can include: — % reduction in GHG emissions per unit of production; — % reduction in energy consumption per unit of production.

Table 5 *(continued)*

Rationale	
The principles and potential quantitative metrics over a defined baseline related to improvements in existing manufacturing facilities as well as to the construction of efficient new manufacturing facilities. They apply to GHG reductions from energy efficiency, resource efficiency and other measures in manufacturing sectors that are not covered by sector-specific criteria in the taxonomy.	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under "sector criteria" above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaption.
(3) Water	Limitation of the use of water resources to clean or refresh the process based on water resource management.
(4) Circular economy	Waste and by-products, especially hazardous waste, are managed in line with waste treatment management.
(5) Pollution	Ensure emissions to air and water are within the best practice range set for energy and resource efficient processes. Ensure implementation of a recognized environmental management system (e.g. ISO 14001 or equivalent).
(6) Ecosystems	For operations located in a protected area, or which include activities outside a protected area but likely to have a significant negative impact on its biodiversity, ensure that an appropriate assessment based on the conservation objectives of the protected area has been conducted in conformity with one of the following: — IFC Performance Standard 6, *Biodiversity Conservation and Sustainable Management of Living Natural Resources*; — an equivalent national standard. For such operations, a site-level biodiversity management plan shall be implemented.

Table 6 — Manufacture of low-carbon technologies

Sector classification and activity	
Macro-sector	Manufacturing
Description	Manufacture of: — products, key components and machinery that are essential for eligible renewable energy technologies; — eligible low-carbon transport vehicles, fleets and vessels; — eligible energy efficiency equipment for buildings; — other low-carbon technologies that result in GHG emission reductions in other sectors of the economy (including private households).
Sector criteria	
Potential environmental benefits	The manufacture of low-carbon technologies that result in substantial GHG emission reductions in other sectors of the economy (including private households) are eligible.
Environmental performance indicators	See B.3.1.

Table 6 *(continued)*

Rationale	
The manufacture of low-carbon technologies that result in substantial GHG emission reductions in other sectors of the economy (including private households) is eligible if they demonstrate substantially higher net GHG emission reductions compared to the best performing alternative technology/product/solution available on the market on the basis of a recognized/standardized cradle-to-grave carbon footprint (e.g. ISO 14067, ISO 14040, ISO 14044 or ISO 14025). The list of specific eligible technologies is coherent with the eligible activities in other sections of the taxonomy, namely energy, transport and buildings. In some cases, the list is less broad than the eligible activities in the corresponding section of the taxonomy due to limited resources to explore in this phase the implications for use in other sectors of the same products, components, equipment and infrastructure. Further analysis is required to ensure no perverse incentives occur. For transport, the manufacture is focused on the production of "low-carbon" or "zero-carbon" vehicles, fleets or vessels, so that either revenue from sales of eligible vehicles or expenditure on investments in manufacturing capacity specifically relating to eligible vehicles can be identified.	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
The main potential significant harm to other environmental objectives from the manufacture of low-carbon technologies is associated with the potential: — use of toxic substances and generation of toxic wastes (both at the manufacturing stage as well as at other stages of the product/equipment life cycle); — for polluting emissions to air, water and soil from the manufacturing process. Depending on the product/equipment being manufactured, there can also be issues with respect to the embodied carbon and the demand for certain metals and materials (e.g. rare earth metals) which are in limited supply and can have significant environmental impact issues associated with the mining phase.	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under "sector criteria" above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.
(3) Water	Limitation of the use of water resources to clean or refresh the process based on water resource management.
(4) Circular economy	Low-carbon technologies are an opportunity to reorganize the chain of value and promote some short local relationships in the chain of production. Low-carbon technologies shall be involved in the circular economy to recycle, reuse, remanufacture and maintain the long-term life of products (e.g. long-term availability of spare parts) and reduce raw material consumption.
(5) Pollution	Conformity with restriction of chemicals and the restriction of hazardous substances or the equivalent for equipment manufactured.
(6) Ecosystems	Low-carbon technologies should not harm ecosystems more than the technologies currently in use.

Table 7 — Manufacture of cement and alternative binders

Sector classification and activity	
Macro-sector	Manufacturing
Description	Manufacture of cement
Sector criteria	
Potential environmental benefits	The manufacturing of cement is associated with significant CO_2 emissions. Minimizing process emissions through energy efficiency improvements and switch to alternative fuels, promoting the reduction of the clinker-to-cement ratio and the use of alternative clinkers and binders can contribute to the mitigation objective. The manufacturer shall source raw materials from sites following best quarrying practices.

Table 7 *(continued)*

Environmental performance indicators	Environmental performance indicators can include: a) specific emissions (tCO_2e/t of clinker); b) specific emissions (tCO_2e/t of cement or alternative binder).
Rationale	
Cement production is responsible for more than 70 % of the sector emissions and concrete is the most significant application for the use of cement. Cement is the main constituent of concrete. The content of cement in the concrete and total net GHG emissions can vary significantly based on the specifications of the application that concrete will be used for. For this reason, concrete is not covered by the taxonomy. Cement manufacture includes three main stages: 1. raw materials preparation; 2. clinker production; 3. grinding of clinker with other components such as gypsum, fly ash, ground granulated blast furnace slag (GGBFS) and fine limestone to produce the finished cement. Typically, 30 % to 40 % of direct CO_2 emissions comes from the combustion of fuels. The remaining 60 % to 70 % comes from the chemical reactions involved in converting limestone to calcium oxide. Reducing emissions from the manufacturing process of cement can therefore positively contribute to the mitigation objective. Electricity: Indirect emissions from the use of electricity during clinker and cement production. The main users of electricity in cement plants are mills (grinding of cement, milling of raw materials) and exhaust fans (kiln/raw mill and cement mill, which together account for more than 80 % of the electrical energy usage). Electricity demand in cement plants ranges from 90 kWh/t to 150 kWh/t cement. As the cement plant operates under high O_2 concentration or pre-treats during clinker production by utilizing alternative fuels and raw materials, it is not always possible to achieve the expected range of thermal energy intensity of clinker. A global average electric energy demand for cement manufacturing of 104 kWh/t cement was reported by the Cement Sustainability Initiative (CSI) for the years 2012 to 2014. The CSI data covers more than 900 plants worldwide, and all technologies and clinker and cement types. The variations in the data are significant. The 10 % best in class show figures of 85 kWh/t cement and below, while the 90 % percentile amounted to 129 kWh/t cement. Taking into account that decarbonization of the cement sector will run in parallel with decarbonization of the energy sector, it is expected that the electricity required for cement manufacture in the near future will come from renewable sources and thus a specific threshold for specific electricity consumption is not proposed. Based on the above-mentioned information and sources, it is expected that the best-in class plants have specific electricity consumption of 85 kWh/t cement. — Improving energy efficiency: Thermal energy intensity of clinker and the electric intensity of cement can be reduced by deploying existing state-of-the-art technologies in new cement plants and retrofitting existing facilities to improve energy performance levels when economically viable. — Switching to alternative fuels: The life cycle carbon intensity of cement clinker can be reduced significantly using biomass and waste materials as fuels in cement kilns. The clinker-burning process offers good conditions for using different types of waste materials replacing parts of the consumption of carbon-intensive fossil fuels. A wide range of different types of wastes can be used as fuel but as these can replace primary fuel in cement kilns, a consistent waste quality is essential (e.g. adequate calorific value, metal, halogen, ash content). — Reducing the clinker to cement ratio: Increasing the use of blended materials and the market deployment of blended cements is very important for the decarbonization of the sector and alignment with a low-carbon pathway. This requires substitution of cement clinker by mineral additives such as fly ash, silica fume, blast-furnace slag or limestone. The amount of clinker substitute that can be blended in the cement depends on the type of substitute and the type of cement produced. Some mineral additives, e.g. granulated blast furnace slag (GBFS), allow for substitution levels of over 70 %. Revision of the cement and concrete standards, building codes and public procurement regulations would be required in order to allow more widespread use of blended cements with very high substitution of clinker (e.g. > 60 %) while ensuring product reliability and durability at final application in an individual country or region.	

Table 7 *(continued)*

<table>
<tr><td colspan="2">— Alternative clinkers and binders: Alternative clinker formulations (e.g. belite, CSA, BCSA, CACS, MOMS) and alternative binders (e.g. alkali-activated binders) could offer potential opportunities for CO_2 emission reductions by using different mixes of raw materials or alternatives compared to Portland cement. Their commercial availability and applicability differ widely. Further efforts are required to support the demonstration, testing and earlier stage research for alternative clinkers and binders and to develop standards to facilitate market deployment. The specification of the benchmark based on tonne of binder will allow investments in these types of novel alternative binders to be considered for eligibility.
— Potential for soil and groundwater contamination associated with the handling and storage of (hazardous) wastes used as a fuel substitute (“secondary” fuels) in the cement production process and raw material substitutes such as slags, industrial residues, non-ferrous products, sludges, because if they are not well contained they can contribute to soil and groundwater pollution.
— Renewable energy generation and use: In the production of cement, the use of electricity from renewable energy sources could be also explored as a measure to reduce the electric intensity of the final cement product. This can be achieved through different strategies including implementing renewable-based captive power generation, power purchase agreements that ensure electricity imports are provided from renewable sources or demand-side response strategies that enable a flexible electricity demand (e.g. a flexible operating strategy of grinding plants throughout the day). Various renewable-based options are available for cement manufacturers including wind power, solar PV power, solar thermal power and small hydropower generation. Potential deployment of these technologies in cement plants is highly dependent on local conditions.
— Transportation emissions: The emissions from transportation are excluded as these represent only a small percentage of the total emissions of cement manufacture.</td></tr>
<tr><td colspan="2">DNSH assessment (to evaluate impacts that are not the core environmental objective)</td></tr>
<tr><td colspan="2">The main potential significant harm to other environmental objectives from cement manufacturing is associated with:
— polluting emissions to air associated to the consumption of fossil fuels and calcination reactions in the cement kiln;
— water consumption at production facilities located in areas of water scarcity;
— potential for soil and groundwater contamination associated with the handling and storage of (hazardous) wastes used as a fuel substitute (“secondary” fuels) in the cement production process.</td></tr>
<tr><td>(1) Climate mitigation</td><td>Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under “sector criteria” above.</td></tr>
<tr><td>(2) Adaptation</td><td>Reducing material physical climate risks and supporting system adaptation.</td></tr>
<tr><td>(3) Water</td><td>For operations situated in areas of water scarcity, ensure that water use/conservation management plans, developed in consultation with relevant (local) interested parties, exist and are implemented.</td></tr>
<tr><td>(4) Circular economy</td><td>Cement manufacturing plants accept alternative fuels such as solid recovered fuels (SRFs) originating from waste, as well as secondary raw materials such as recycled concrete aggregates (RCAs).
For cement production sites using hazardous wastes as alternative fuels, ensure a waste management plan that meets International Standards exists and is implemented.</td></tr>
<tr><td>(5) Pollution</td><td>Ensure emissions to air and water are within the best practice ranges set for the production of cement, lime and magnesium oxide.
Ensure implementation of a recognized environmental management system (e.g. ISO 14001 or equivalent).</td></tr>
</table>

Table 7 *(continued)*

(6) Ecosystems	For operations located in a protected area, or which include activities outside a protected area but likely to have a significant negative impact on its biodiversity, ensure that an appropriate assessment based on the conservation objectives of the protected area has been conducted in conformity with one of the following: — IFC Performance Standard 6, *Biodiversity Conservation and Sustainable Management of Living Natural Resources*; — an equivalent national standard. For such operations, a site-level biodiversity management plan shall be implemented.

Table 8 — Manufacture of aluminium

Sector classification and activity	
Macro-sector	Manufacturing
Description	Manufacture of aluminium
Sector criteria	
Potential environmental benefits	The manufacturing of aluminium is a highly energy intensive process. The CO_2 emissions related to the production of aluminium are primarily energy indirect emissions (i.e. from the generation of the electricity used). Aluminium manufacturing is eligible if relying on low-carbon electricity and reduced direct emissions. Additionally, all aluminium recycling is eligible due to significantly lower emissions than primary production.
Environmental performance indicators	Environmental performance indicators can include: — GHG emissions per unit of production: tCO_2e/t aluminium (direct emissions); — energy efficiency for the electrolysis: MWh/t primary aluminium production; — average GHG emissions associated with electricity production per unit of electricity used: gCO_2e/kWh (indirect emissions).
Rationale	
Emissions related to the production of aluminium are primarily related to the use of electricity. Electricity costs contribute to more than 50 % of the production costs. Consequently, there is a strong incentive for the aluminium industry to aim for improving energy efficiency. The key action for aluminium production to make a substantial contribution to climate change mitigation is to increase its share of the use of low-carbon electricity. It is acknowledged that aluminium production facilities can play an important role in stabilizing electricity grids by active management of electricity demand. This can result in substantial mitigation contributions, e.g. by limiting the need for electricity storage facilities. However, given the lack of available metrics to quantify these impacts, these benefits are not taken into account at this stage. It is also acknowledged that aluminium will play a role in a low-carbon economy, in particular enabling light-weight products and electrification (including transmission wires with low conductivity losses). Such applications could also be considered eligible under the activity "manufacture of other low-carbon technologies" provided they can demonstrate substantial emission reductions according to the criteria for that activity. All aluminium recycling and the manufacture of aluminium products with high recycling rates is considered to make a substantial contribution to climate change mitigation because of its association with much lower emissions than primary production. The emissions covered are as follows: — Direct emissions: all direct GHG emissions related to the production (the processes' direct GHG emissions and the emissions due to fuel use for on-site energy production). — Indirect emissions as a minimum: GHG emissions related to electricity consumption for the electrolysis process and related emissions from the generation of electricity used.	

Table 8 *(continued)*

DNSH assessment (to evaluate impacts that are not the core environmental objective)	
The main potential significant harm to other environmental objectives from the manufacture of aluminium is associated with: — the potential for significant air emission impacts: perfluorocarbons, fluoride gases, polycyclic aromatic hydrocarbons (PAHs), and particulate matter (e.g. unused cryolite); hydrogen fluorides can be toxic to vegetation; — the toxic, corrosive and reactive nature of waste generated by used linings (cathodes) from the electrolytic cells [known as "spent pot lining" (SPL)]. Dissolved fluorides and cyanides from the SPL material can create significant environmental impacts including groundwater contamination and pollution of local watercourses; — potential to impact ecosystems as a result of the land footprint of the site and from polluting emissions to air.	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under "sector criteria" above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.
(3) Water	Manage the discharge resulting from the refining of bauxite and extraction of aluminium referred to as "red mud." For operations situated in areas of water scarcity, ensure that water use/conservation management plans, developed in consultation with relevant (local) interested parties, exist and are implemented.
(4) Circular economy	Measures are in place to minimize and manage waste (including hazardous waste) and material use in accordance with the non-ferrous metals industries. Alloy-specific aluminium sorting should be required to facilitate recycling.
(5) Pollution	Manage the discharge resulting from the refining of bauxite and extraction of aluminium referred to as "red mud." Emissions to air [e.g. sulfur dioxide (SO_2), nitrogen oxide (NO_x), particulate matter, total organic carbon (TOC), dioxins, mercury (Hg), hydrogen chloride (HCL), hydrogen fluoride (HF), total fluoride and perfluorinated hydrocarbons (PFCs)] are within the best practice ranges for the non-ferrous metals industries. Ensure implementation of a recognized environmental management system (e.g. ISO 14001 or equivalent).
(6) Ecosystems	Manage the discharge resulting from the refining of bauxite and extraction of aluminium referred to as "red mud." For operations located in a protected area, or which include activities outside a protected area but likely to have a significant negative impact on its biodiversity, ensure that an appropriate assessment based on the conservation objectives of the protected area has been conducted in conformity with one of the following: — IFC Performance Standard 6, *Biodiversity Conservation and Sustainable Management of Living Natural Resources*; — an equivalent national standard. For such operations, a site-level biodiversity management plan shall be implemented.

Table 9 — Manufacture of iron and steel

Sector classification and activity	
Macro-sector	Manufacturing
Description	Manufacture of iron and steel
Sector criteria	
Potential environmental benefits	Manufacturing of iron and steel at the level of performance achieved by best performing plants (e.g. using BAT) is considered to make a substantial contribution to climate change mitigation.
Environmental performance indicators	Environmental performance indicators can include: — net GHG emissions improvement (tCO_2e)/t product; — energy consumption (MJ)/t product.
Rationale	
In the long term, the iron and steel making industry should aim at implementing breakthrough technologies (characterized by ultra-low CO_2 emissions). Some of these technologies have already been demonstrated at the pilot scale but most are still in the early stages of development. Until these technologies become commercially available, requiring steel makers globally to apply current BAT would achieve significant CO_2 emission reductions in the sector. Once the technologies become commercially available, they will become part of BAT for steel production and accessible for implementation. Currently the uptake of BAT in the iron and steel sector varies around the world. Improving the performance of iron and steel plants globally to the level of BAT would bring significant benefits both in energy efficiency and CO_2 emission reductions. In the meantime, finance for BAT plays an important role especially in emerging economies where demand for steel continues to increase and new and additional production capacity expansion is being planned. This activity focuses on the greening of iron and steel manufacturing due to its high contribution to global net GHG emissions. The potential of "greening by" products made of iron and steel can be addressed by applying ISO 14040 and ISO 14044. Another important aspect of steel is its recyclability, which can be addressed by conducting life cycle inventory (LCI) studies of steel products based on ISO 20915. In addition, mentioning it in the specific description of a company and its product portfolio and through other activities such as "manufacture of other low-carbon technologies" where, according to the criteria given for this activity, the manufacturer can prove the overall environmental benefits over the whole life. Production of steel using scrap steel leads to significantly lower emissions both in the basic oxygen furnace (BOF) and electric arc furnace (EAF) processes, i.e. in the manufacturing phase of the life cycle. Production of some steels such as high alloy or stainless steels, which require higher amounts of alloying elements, will require more virgin material input. All steel recycling and the manufacture of steel products with high recycling rates are considered to make a substantial contribution to climate change mitigation. It is acknowledged that steel will play a role in a low-carbon economy, by enabling lighter weight products through the use of high strength steels, enabling renewable energy, etc.	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
The main potential significant harm to other environmental objectives from iron and steel production is associated with: — emissions to air from coke-making and smelting operations, especially particulate matter (dust), oxides of nitrogen, sulfur dioxide, carbon monoxide, chlorides, fluorides, volatile organic compounds, polycyclic aromatic hydrocarbons (PAHs), polychlorinated dibenzo-dioxins/furans and heavy metals; — emissions to water of hydrocarbons and suspended solids; — water consumption for quenching and cooling operations in areas of water scarcity; — the potential to impact local ecosystems and biodiversity due to polluting emissions (if not properly mitigated) and due to the large land footprint of the operations and associated ancillary activities.	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under "sector criteria" above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.
(3) Water	For operations situated in areas of water scarcity, ensure that water use/conservation management plans, developed in consultation with relevant (local) interested parties, exist and are implemented.

Table 9 *(continued)*

(4) Circular economy	Measures are in place to minimize and manage waste (including hazardous waste) and material use in accordance with iron and steel production. Even though almost all steel products are recycled as scrap and used for making new steel products so far, it is important to advance the recycling system. In order to avoid irretrievable loss of alloying elements and unnecessary resource and energy consumption, steel scrap shall be collected and sorted and used accordingly in steel production.
(5) Pollution	Ensure emissions to water and air are within the best practice ranges for iron and steel production [e.g. for pH, total suspended solids (TSS), chemical oxygen demand (COD), chromium (total) and heavy metals, sulfur dioxide (SO_2), nitrogen oxide (NO_x), particulate matter, polychlorinated dibenzo-dioxins/furans, mercury (Hg), hydrogen chloride (HCL), hydrogen fluoride (HF)]. Ensure implementation of a recognized environmental management system (e.g. ISO 14001 or equivalent).
(6) Ecosystems	For operations located in a protected area, or which include activities outside a protected area but likely to have a significant negative impact on its biodiversity, ensure that an appropriate assessment based on the conservation objectives of the protected area has been conducted in conformity with one of the following: — IFC Performance Standard 6, *Biodiversity Conservation and Sustainable Management of Living Natural Resources*; — an equivalent national standard. For such operations, a site-level biodiversity management plan shall be implemented.

Table 10 — Manufacture of hydrogen

Sector classification and activity	
Macro-sector	Manufacturing
Description	Manufacture of hydrogen
Sector criteria	
Potential environmental benefits	The manufacturing of hydrogen is a highly carbon-intensive activity within the chemical industry. Therefore, reducing emissions from the manufacturing activity itself can positively contribute to mitigation objectives.
Environmental performance indicators	Environmental performance indicators can include: — emission factor: net GHG emissions per unit of production: tCO_2e/t hydrogen; — performance for electricity use: MWh/t hydrogen; — emissions factor, net GHG emissions per unit of production for electricity used: gCO_2e/kWh.
Rationale	
Currently, almost 96 % of industrially produced hydrogen is manufactured via steam reforming using fossil fuels: 48 % natural gas, 30 % liquid hydrocarbons and 18 % coal. Steam reforming is a mature process, associated with high CO_2 emissions and incompatible with the strategy for long-term GHG emission reductions. Minimizing emissions from hydrogen manufacturing, by promoting low-carbon emission production processes, can positively contribute to the mitigation objective.	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
The main potential significant harm to other environmental objectives from the manufacture of hydrogen is, in practical terms, inseparable from the potential for significant harm created by hydrocarbon refining activities more generally and is associated with:	

Table 10 *(continued)*

— polluting emissions to air (in the case of hydrogen production via electrolysis, there is an indirect environmental impact associated with the generation of electricity); — water used for cooling can lead to local resource depletion, dependent of the local scarcity of water resources; — the generation of wastes (e.g. spent catalysts and by-products of the various physical and chemical treatment processes used in purifying the hydrogen produced via hydrocarbon processing).	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under "sector criteria" above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.
(3) Water	For operations situated in areas of water scarcity, ensure that water use/conservation management plans, developed in consultation with relevant (local) interested parties, exist and are implemented.
(4) Circular economy	Where manufacture of hydrogen takes place within the context of an oil and gas refining installation, ensure appropriate measures are in place to minimize and manage waste and material use in accordance with the BAT conclusions of the refining of mineral oil and gas.
(5) Pollution	Ensure that emissions to air are within the best practice ranges for the refining of mineral oil and gas and for the chemical industry (e.g. for large volume inorganic chemicals: ammonia, acids and fertilizers). Ensure implementation of a recognized environmental management system (e.g. ISO 14001 or equivalent).
(6) Ecosystems	For operations located in a protected area, or which include activities outside a protected area but likely to have a significant negative impact on its biodiversity, ensure that an appropriate assessment based on the conservation objectives of the protected area has been conducted in conformity with one of the following: — IFC Performance Standard 6, *Biodiversity Conservation and Sustainable Management of Living Natural Resources*; — an equivalent national standard. For such operations, a site-level biodiversity management plan shall be implemented.

Table 11 — Manufacture of inorganic basic chemicals

Sector classification and activity	
Macro-sector	Manufacturing
Description	Includes manufacture of: — carbon black; — disodium carbonate (soda ash); — chlorine.
Sector criteria	
Potential environmental benefits	Reducing the emissions from the manufacturing of carbon black and soda ash and improving energy efficiency and switching to low-carbon electricity in the manufacturing of chlorine can positively contribute to the climate change mitigation objective.
Environmental performance indicators	For carbon black and soda ash, environmental performance indicators can include: — net GHG emissions (tCO_2e)/t product; — net GHG emissions shall be calculated according to the methodology used for benchmarks. For the manufacturing of chlorine, environmental performance indicators can include: — electricity use: MWh/t chlorine (alternating current at "X" kA/m^2).

Table 11 *(continued)*

	Carbon intensity of the electricity used for chlorine manufacturing: gCO_2e/kWh. For the manufacturing of all chemicals covered in this activity, the selected metric is: — emission factor: net GHG emissions per unit of production (tCO_2e/t); — water metric: water consumption per unit of production (m^3/ton); — effluents metric: effluents generation per unit of production (m^3/ton); — waste metric: waste generation per unit of production (m^3/ton).
Rationale	
The carbon black manufacturing process accounts for approximately 3,4 % of the net GHG emissions from the chemical sector, while the manufacturing of soda ash accounts for 1,5 % of the emissions. Reducing the manufacturing emissions for carbon black and soda ash and improving energy efficiency in the manufacturing of chlorine can positively contribute to the mitigation objective. The absolute performance approach has been proposed in order to identify the maximum acceptable carbon intensities of the manufacturing processes of carbon black and soda ash that the activities should comply with in order to be able to substantially contribute to the mitigation objective. Product benchmarks have been selected as thresholds for the manufacturing of carbon black and soda ash. They reflect the average performance of the 10 % most efficient installations in sector. All direct emissions related to production (the process direct emissions and the emissions due to fuel use for energy production) are covered. NOTE According to the methodology to calculate related benchmarks, emissions from electricity are considered where direct emissions and indirect emissions from electricity are to a certain level interchangeable (as is the case for carbon black but not for soda ash). For the manufacturing of chlorine, the process shall be based on low-carbon electricity.	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
The main potential significant harm to other environmental objectives from the manufacture of carbon black is associated with: — polluting emissions to air, especially volatile organic compounds (VOCs) and dust; — the use of water for cooling purposes in areas of water scarcity; — generation of waste. The main potential significant harm to other environmental objectives from the manufacture of soda ash is associated with: — the generation of process effluents (e.g. calcium chloride in aqueous solution) by-products and wastes with the potential to pollute groundwater and surface water bodies as well as soils; — polluting air emissions; — the use of water in areas of water scarcity for cooling purposes, and impacts on ecosystems and biodiversity from the disposal of wastes and by-products [primarily calcium carbonate, gypsum, sodium chloride and calcium chloride, although there can be trace amounts of toxic materials such as mercury, cadmium, arsenic and zinc depending on the source of the raw materials (e.g. limestone) for the production process] which create “waste beds”. The main potential significant harm to other environmental objectives from the manufacture of chlorine is associated with: — polluting emissions to air (e.g. chlorine); — process water effluents that can contain oxidizing agents (e.g. chlorine); — use of water in areas of water scarcity; — generation of waste.	

Table 11 *(continued)*

(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under "sector criteria" above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.
(3) Water	For operations situated in areas of water scarcity, ensure that water use/conservation management plans, developed in consultation with relevant (local) interested parties, exist and are implemented.
(4) Circular economy	Wastes and by-products, especially hazardous manufacturing wastes, are managed in line with waste treatment best practices for large volume inorganic chemicals-solids and other industries.
(5) Pollution	Ensure polluting emissions to air are within best practice ranges for chemicals and other industries. Ensure implementation of a recognized environmental management system (e.g. ISO 14001 or equivalent).
(6) Ecosystems	For operations located in a protected area, or which include activities outside a protected area but likely to have a significant negative impact on its biodiversity, ensure that an appropriate assessment based on the conservation objectives of the protected area has been conducted in conformity with one of the following: — IFC Performance Standard 6, *Biodiversity Conservation and Sustainable Management of Living Natural Resources*; — an equivalent national standard. For such operations, a site-level biodiversity management plan shall be implemented.

Table 12 — Manufacture of organic basic chemicals

Sector classification and activity	
Macro-sector	Manufacturing
Description	Manufacture of the following organic chemicals: — high volume chemicals: — acetylene; — ethylene; — propylene; — butadiene; — aromatics: — mixed alkylbenzenes and mixed alkylnaphthalenes; — cyclohexane; — benzene; — toluene; — o-Xylene; — p-Xylene; — m-Xylene and mixed xylene isomer; — ethylbenzene; — cumene;

Table 12 *(continued)*

	— biphenyl, terphenyls, vinyltoluenes, other cyclic hydrocarbons excluding cyclanes, cyclenes, cycloterpenes, benzene, toluene, xylenes, styrene, ethylbenzene, cumene, naphthalene and anthracene; — benzol (benzene), toluol (toluene) and xylol (xylenes); — naphthalene and other aromatic hydrocarbon mixtures (excluding benzole, toluole, and xylole); — vinyl chloride; — styrene; — ethylene oxide; — monoethylene glycol; — adipic acid; — organic chemicals: — industrial monocarboxylic fatty acids and acid oils from refining; — saturated acyclic monocarboxylic acids and their derivatives; — unsaturated monocarboxylic, cyclanic, cyclenic or cycloterpenic acyclic polycarboxylic acids and their derivatives; — aromatic polycarboxylic and carboxylic acids with additional oxygen functions and their derivatives, except salicylic acid and its salts.
Sector criteria	
Potential environmental benefits	The manufacturing of organic chemicals is associated with significant CO_2 emissions. Minimizing process emissions and promoting the manufacturing of organic chemicals with renewable feedstock can contribute to the mitigation objective.
Environmental performance indicators	For the manufacturing of all chemicals covered in this activity [except for chemicals listed in a) to d) below], the selected metric is: — net GHG emissions per unit of production (tCO_2e/t) based on a carbon footprint study in accordance with ISO 14067. Separate eligibility criteria apply to the following organic compounds: a) industrial monocarboxylic fatty acids; acid oils from refining; b) saturated acyclic monocarboxylic acids and their derivatives; c) unsaturated monocarboxylic, cyclanic, cyclenic or cycloterpenic acyclic polycarboxylic acids and their derivatives; d) aromatic polycarboxylic and carboxylic acids with additional oxygen functions, and their derivatives, except salicylic acid and its salts. The organic compounds listed in a) to d) above shall be eligible if they meet the following criteria: — manufacturing of the organic chemicals shall be wholly or partially based on renewable feedstock; — the carbon footprint shall be substantially lower compared to the carbon footprint of the same chemical manufactured from fossil fuel feedstock. Any forest biomass used in the process is committed to sustainable forest management (SFM) certification. For the purpose of applying these criteria, renewable feedstock refers to biomass, industrial biowaste or municipal biowaste. The manufacturing of organic chemicals is associated with significant CO_2 emissions. Minimizing process emissions and promoting the manufacture of organic chemicals with renewable feedstock can contribute to the mitigation objective.

Table 12 *(continued)*

Rationale
The manufacturing of high value chemicals, aromatics, ethylene chloride, vinyl chloride, ethylbenzene, styrene, ethylene oxide, mono ethylene glycol and methanol accounts for significant emissions in the chemical sector. Steam cracking is the main industrial process for manufacturing high value chemicals but is also the most energy intensive one in the chemical industry. Reducing emissions from the manufacturing process of organic chemicals can therefore positively contribute to the mitigation objective. The absolute performance approach has been proposed in order to identify the maximum acceptable carbon intensity that the activity should comply with in order to be able to substantially contribute to the mitigation objective. Note on electricity: According to the methodology to calculate benchmarks, emissions from electricity are considered where direct emissions and indirect emissions from electricity are to a certain level interchangeable. The thresholds have been aligned with the work undertaken in the respective forestry subgroup. The following principles have been applied where biomass use is relevant: — All sustainable forestry management requirements have legislation as minimum baseline. The forest taxonomy includes this overarching principle. — The taxonomy does not include forest plantations because of the mitigation focus. The international guiding principles against deforestation provided by the United Nations Programme on Reducing Emissions from Deforestation and Forest Degradation (UN-REDD)[34] is recognized as an overarching principle. Manufacturing of chemicals: — industrial monocarboxylic fatty acids; and acid oils from refining; — saturated acyclic monocarboxylic acids and their derivatives; — unsaturated monocarboxylic, cyclanic, cyclenic or cycloterpenic acyclic polycarboxylic acids and their derivatives; — aromatic polycarboxylic and carboxylic acids with additional oxygen functions, and their derivatives, except salicylic acid and its salts. It is possible to propose a framework to facilitate sustainable investment that includes “switching to use of renewable materials” to provide a substantial contribution to climate change mitigation. The innovative bio-based chemical sector can contribute to that objective. Therefore, additional criteria have been specified to identify the conditions under which the manufacturing process of organic chemicals, when based on renewable feedstock such as biomass, can substantially contribute to the mitigation objective. Bio-based chemicals are defined as chemical products that are wholly or partly derived from materials of biological origin (e.g. biomasses, feedstock, plants, algae, crops, trees, marine organisms, biological waste). Given their expected limited environmental footprint in comparison to their traditional counterparts, bio-based chemicals have recently emerged on markets as valid, environmentally friendly alternatives to standard chemicals.
DNSH assessment (to evaluate impacts that are not the core environmental objective)
The main potential significant harm to the environment from the production of other organic chemicals is associated with: — polluting emissions to air and water from the production process; — vulnerable ecosystems damage by the construction and/or operation of the production facilities; — the use of water resources for production purposes (e.g. cooling water) in areas of water scarcity; — the generation of hazardous waste.

Table 12 *(continued)*

(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under "sector criteria" above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.
(3) Water	For operations situated in areas of water scarcity, ensure that water use/conservation management plans, developed in consultation with relevant (local) stakeholders, exist and are implemented.
(4) Circular economy	Waste and by-products, especially hazardous waste, are managed in line with waste treatment management.
(5) Pollution	Ensure polluting emissions to air, soil and water are best practice ranges as set out in the following documents, as applicable: — large volume organic chemicals (LVOC); — common wastewater and waste gas (CWW); — emissions from storage (EFS); — refining of mineral oil and gas (REF); — waste treatment (WT); — waste incineration (WI). Ensure implementation of a recognized environmental management system (e.g. ISO 14001 or equivalent).
(6) Ecosystems	For operations located in a protected area, or which include activities outside a protected area but likely to have a significant negative impact on its biodiversity, ensure that an appropriate assessment based on the conservation objectives of the protected area has been conducted in conformity with one of the following: — IFC Performance Standard 6, *Biodiversity Conservation and Sustainable Management of Living Natural Resources*; — an equivalent national standard. For such operations, a site-level biodiversity management plan shall be implemented.

Table 13 — Manufacture of fertilizers and nitrogen compounds

Sector classification and activity	
Macro-sector	Manufacturing
Description	Manufacture of: — anhydrous ammonia; — nitric acid; — alternative organic fertilizers from natural sources.
Sector criteria	
Potential environmental benefits	The manufacturing of ammonia and nitric acid is highly carbon intensive. Therefore, reducing emissions from the manufacturing activity itself can positively contribute to the mitigation objective. Alternative organic fertilizers from natural sources are better for the environment.
Environmental performance indicators	Metric for nitric acid manufacturing: — emission factor: tCO_2e/t nitric acid. Net GHG emissions shall be calculated in accordance with ISO 14064-2. Metric for ammonia manufacturing:

Table 13 *(continued)*

	— direct emissions: tCO_2/t ammonia; — combined CO_2 emissions (indirect emissions): tCO_2/t ammonia. For the calculation of emissions from the manufacturing process of ammonia, both steps (i.e. production of the intermediate product hydrogen and synthesis of the ammonia) are considered.
Rationale	
Reducing emissions from manufacturing processes can positively contribute to the mitigation objective. The ammonia sector is expected to substantially contribute to net GHG emissions reduction, notably by using hydrogen produced from electrolysis. During the manufacturing process of nitric acid, the main type of GHG generated is nitrous oxide and, by applying the available technologies, it is possible to achieve more than 80 % of emission reductions. The selected metric for nitric acid is the emission factor, in terms of net GHG emissions per unit of production.	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
The main potential significant harm to the environment from the production of nitric acid or ammonia production is associated with: — polluting emissions to air [especially nitrous oxide (N_2O), nitrogen oxides (NO_x) and ammonia (NH_3)] from the production process; — vulnerable ecosystems can be damaged by the construction or operation of production facilities; — the use of water resources for production purposes (especially for cooling processes) in areas of water scarcity; — the generation of hazardous wastes (e.g. spent catalyst material).	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under “sector criteria” above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.
(3) Water	For operations situated in areas of water scarcity, ensure that water use/conservation management plans, developed in consultation with relevant (local) interested parties, exist and are implemented.
(4) Circular economy	Wastes and by-products, especially hazardous wastes, are managed in line with waste treatment best management practices.
(5) Pollution	Ensure polluting emissions to air [e.g. nitrous oxide (N_2O), nitrogen oxides (NO_x) and ammonia (NH_3)] and water are within best practice ranges. Ensure implementation of a recognized environmental management system (e.g. ISO 14001 or equivalent).
(6) Ecosystems	For operations located in a protected area, or which include activities outside a protected area but likely to have a significant negative impact on its biodiversity, ensure that an appropriate assessment based on the conservation objectives of the protected area has been conducted in conformity with one of the following: — IFC Performance Standard 6, *Biodiversity Conservation and Sustainable Management of Living Natural Resources*; — an equivalent national standard. For such operations, a site-level biodiversity management plan shall be implemented.

Table 14 — Manufacture of plastics in primary form

Sector classification and activity	
Macro-sector	Manufacturing
Description	Manufacture of plastics in primary form
Sector criteria	
Potential environmental benefits	The manufacturing of plastics is associated with significant life cycle CO_2 emissions. Materials recirculation and manufacture of polymers with renewable feedstock can contribute to reduce CO_2 emissions from the plastic sector.
Environmental performance indicators	Manufacture of plastics in primary form shall conform with at least one of the following three criteria and, when relevant with the additional criteria, as given below: 1. Plastics in primary form shall be manufactured by mechanical recycling. 2. Plastics in primary form shall be manufactured by chemical recycling. When applying criterion 2, the carbon footprint of plastics in primary form, manufactured by chemical recycling, shall be lower when compared to the carbon footprint of plastics in primary form manufactured with fossil fuel feedstock. For criteria 1 and 2, the carbon footprint calculation should also account for the avoided GHG emissions from the combustion, incineration or degradation of plastic waste. 3. Manufacture of plastics in primary form shall be wholly or partially derived from renewable feedstock and the carbon footprint of plastics in primary form, manufactured wholly or partially from renewable feedstock, shall be lower when compared to the carbon footprint of plastics in primary form manufactured with fossil fuel feedstock. For the purpose of applying criterion 3, renewable feedstock refers to biomass, industrial biowaste or municipal biowaste. The activity shall conform with the following additional criteria. If feedstock is biomass (excluding industrial and municipal biowaste): — a full traceability of sourcing through the corresponding chain of custody management system shall be in place and its requirements fulfilled; — any forest biomass used in the process shall conform with the appropriate taxonomy where applicable; — any forest biomass used in the process shall be sourced from sustainable forests (methods to demonstrate conformity with SFM requirements include self-declarations provided by the organization, second-party assessments conducted by interested parties and certification by a third party); — forest biomass coming from irrigated forest plantations shall not be used; — any biomass used in the process shall be subject to a transparent, credible chain of custody as defined in ISO 13065; — the biomass shall not come from agricultural land that has been the subject of land use change from forest or pasture since 2008; — in particular for forest biomass, small-scale palm oil cultivators operating in existing forest plantations should be eligible if they receive their fair share of profits. If feedstock is industrial biowaste (including waste from food or feed industries) or municipal biowaste, any solid biowaste used in the manufacturing process shall originate from source-segregated and separately collected (non-hazardous) waste streams (i.e. shall not be separated from mixed residual waste).

Table 14 *(continued)*

Rationale To be eligible, manufacture of plastics shall have a minimum of recycled or bio-based content. In order to reduce CO_2 emissions from the plastics sector, it is therefore important to promote materials recirculation and manufacture of polymers with renewable feedstock. The criteria for the manufacturing of plastics from renewable feedstock are based on: — emissions from the manufacturing process of plastics; — CO_2 emissions. The manufacturing of plastics in primary form is covered by the definition of "primary form" including liquids, pastes, blocks, irregular shapes, lumps, powders (including moulding powders), granules, flakes and similar bulk forms. It follows that the criteria for activity should aim to promote the manufacture of plastic products which are: — substantially based on recycled plastics, to minimize the production of virgin plastics; — based on plastics in primary form, which are wholly or partially derived from renewable feedstock.	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
The main potential significant harm to the environment from the production of plastics in primary form is associated with: — polluting emissions to air and water from the production process; — vulnerable ecosystems can be damaged by the construction or operation of the production facilities; — the use of water resources for production purposes (e.g. cooling water) in areas of water scarcity; — the generation of hazardous wastes.	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under "sector criteria" above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.
(3) Water	For operations situated in areas of water scarcity, ensure that water use/conservation management plans, developed in consultation with relevant (local) interested parties, exist and are implemented.
(4) Circular economy	Wastes and by-products, especially hazardous wastes, are managed in line with waste treatment best management practices.
(5) Pollution	Ensure polluting emissions to air, soil and water are within best practice ranges. Assess workers' exposure to chemicals used to process or bring functional properties to plastics as well as potential leakage into the environment as part of wastewaters (e.g. DEHP, PFOA, PAHs). Manufacturers and their contractors should have plastic pellet loss containment measures in place. Ensure implementation of a recognized environmental management system (e.g. ISO 14001 or equivalent).
(6) Ecosystems	For operations located in a protected area, or which include activities outside a protected area but likely to have a significant negative impact on its biodiversity, ensure that an appropriate assessment based on the conservation objectives of the protected area has been conducted in conformity with one of the following: — IFC Performance Standard 6, *Biodiversity Conservation and Sustainable Management of Living Natural Resources*; — an equivalent national standard. For such operations, a site-level biodiversity management plan shall be implemented.

5.4.3 Renewable energy and energy efficiency

The taxonomy for renewable energy and energy efficiency is given in Tables 15 to 33.

These tables are included in the taxonomy because this sector is responsible for a large part of GHG emissions. Emission reductions in this sector steadily contribute to decarbonization, if the best available options are substituted for high carbon intensive processes. This can be done by adopting an inclusive and flexible approach that can be applied to various circumstances of countries and regions without excluding specific technologies from its scope.

Table 15 — Production of electricity from solar PV

Sector classification and activity	
Macro-sector	Renewable energy and energy efficiency
Description	Construction and operation of electricity generation facilities that produce electricity from solar PV
Sector criteria	
Potential environmental benefits	Supports a transition to a low-carbon economy. Avoids a lock-in of technologies which do not support the transition to a low-carbon economy. Ensures that economic activities meet best practices. Ensures equal comparability within an economic activity with regards to achieving low-carbon economy targets. Incorporates technology-specific considerations into secondary metrics and thresholds, where necessary.
Environmental performance indicators	A carbon footprint study in accordance with ISO 14067 should be performed. Environmental performance indicators can include: — gCO_2e/kWh based on ISO 14067 for a specified lifetime.
Rationale	
The electricity supply sector plays a critical role in the transition to a low-carbon and net-zero CO_2e energy future, which may be achieved across the whole grid. The power system is a social infrastructure system that is the foundation in all countries and regions. Electricity production based on renewable energy (bioenergy, geothermal power, hydropower, CSP, solar PV technology, wind energy and ocean energy, etc.) leads to direct and indirect GHG emission reductions. These renewable technologies provide opportunities to build smart electricity networks for low-carbon energy and could be implemented in developed and developing countries as well as in large and small cities.	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
The main potential significant harm to other environmental objectives from the installation and operation of PV panels relate to: — PV installation siting: impacts on ecosystems and biodiversity if built in a designated conservation area or in other areas with important ecosystem and biodiversity values. The impacts from the production and end-of-life management of the PV systems and its component(s) or materials: potentially significant environmental impacts are associated with the sourcing and production of materials and components of PV systems.	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under “sector criteria” above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.
(3) Water	For projects and assets that require water (e.g. for PV panel cleaning) located in areas of water scarcity, ensure that water consumption is minimized by design, and consider the need for water use/conservation management plans, developed in consultation with relevant (local) interested parties, to be developed and implemented.

Table 15 *(continued)*

(4) Circular economy	Ensure the following: — PV panels and associated components have been designed and manufactured for high durability, easy dismantling, refurbishment and recycling; — the reparability of the solar PV installation or plant, due to the accessibility and exchangeability of the components, e.g. capacitors or boards in inverters, or the bypass diodes in the module junction boxes; — field inspection and monitoring tools have been implemented to prevent the occurrence of system failures and for the early detection of faults; — modules and inverter components have been selected that have undergone accelerated life testing to demonstrate durability and low degradation for their expected lifespan in the field (e.g. 15 years for inverters, 25 years for modules).
(5) Pollution	Hazardous emissions: ensure that $SiCl_4$ abatement is correctly managed in solar silicon manufacturing facilities. Hazardous substances: Ensure that the minimum amount of lead and cadmium has been used in module manufacturing, as well as plasticizers or phthalates for cable sheeting and flame-retardant fluoropolymers in inverters.
(6) Ecosystems	For operations located in a protected area, or which include activities outside a protected area but likely to have a significant negative impact on its biodiversity, ensure that an appropriate assessment based on the conservation objectives of the protected area has been conducted in conformity with one of the following: — IFC Performance Standard 6, *Biodiversity Conservation and Sustainable Management of Living Natural Resources*; — an equivalent national standard. For such operations, a site-level biodiversity management plan shall be implemented.

Table 16 — Production of electricity from CSP

Sector classification and activity	
Macro-sector	Renewable energy and energy efficiency
Description	Construction and operation of electricity generation facilities that produce electricity from CSP
Sector criteria	
Potential environmental benefits	Supports a transition to a low-carbon economy. Avoids lock-in of technologies which do not support the transition to a low-carbon economy. Ensures that economic activities meet best practices. Ensures equal comparability within an economic activity with regards to achieving low-carbon economy target. Incorporates technology-specific considerations into secondary metrics and thresholds, where necessary.
Environmental performance indicators	A carbon footprint study in accordance with ISO 14067 should be performed. Environmental performance indicators can include: — gCO_2e/kWh based on ISO 14067 for a specified lifetime.

Table 16 *(continued)*

Rationale	
The electricity supply sector plays a critical role in the transition to a low-carbon and net-zero CO_2e energy future, which may be achieved across the whole grid. The power system is a social infrastructure system that is the foundation in all countries and regions. Electricity production based on renewable energy (bioenergy, geothermal power, hydropower, CSP, solar PV technology, wind energy and ocean energy, etc.) leads to direct and indirect GHG emission reductions. These renewable technologies provide opportunities to build smart electricity networks for low-carbon energy and could be implemented in developed and developing countries as well as in large and small cities.	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
The main potential significant harm to other environmental objectives from CSP is associated with: — construction of the installation and the substantial land take associated with the installation; — impacts to birdlife from high temperatures generated by the plant.	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under "sector criteria" above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.
(3) Water	For CSP technologies that require water located in areas of water scarcity, ensure that water use/conservation management plans, developed in consultation with relevant (local) interested parties, have been developed and implemented.
(4) Circular economy	Not applicable
(5) Pollution	Not applicable
(6) Ecosystems	For operations located in a protected area, or which include activities outside a protected area but likely to have a significant negative impact on its biodiversity, ensure that an appropriate assessment based on the conservation objectives of the protected area has been conducted in conformity with one of the following: — IFC Performance Standard 6, *Biodiversity Conservation and Sustainable Management of Living Natural Resources*; — an equivalent national standard. For such operations, a site-level biodiversity management plan shall be implemented.

Table 17 — Production of electricity from wind power

Sector classification and activity	
Macro-sector	Renewable energy and energy efficiency
Description	Construction and operation of electricity generation facilities that produce electricity from wind power
Sector criteria	
Potential environmental benefits	Supports a transition to a low-carbon economy. Avoids lock-in of technologies which do not support the transition to a low-carbon economy. Ensures that economic activities meet best practices. Ensures equal comparability within an economic activity with regards to achieving low-carbon economy target. Incorporates technology-specific considerations into secondary metrics and thresholds, where necessary.
Environmental performance indicators	A carbon footprint study in accordance with ISO 14067 should be performed. Environmental performance indicators can include: — gCO_2e/kWh for a specified lifetime.

Table 17 *(continued)*

Rationale	
The electricity supply sector plays a critical role in the transition to a low-carbon and net-zero CO_2e energy future, which may be achieved across the whole grid. The power system is a social infrastructure system that is the foundation in all countries and regions. Electricity production based on renewable energy (bioenergy, geothermal power, hydropower, CSP, solar PV technology, wind energy and ocean energy, etc.) leads to direct and indirect GHG emission reductions. These renewable technologies provide opportunities to build smart electricity networks for low-carbon energy and could be implemented in developed and developing countries as well as in large and small cities.	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
In spite of the crucial contribution of wind energy to mitigating climate change, there can be conflicts arising between its deployment and nature conservation at a local level.	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under "sector criteria" above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.
(3) Water	Consider and minimize underwater noise generated in the construction phase during the installation of bottom-fixed offshore wind turbine foundations which can impact mammal species in the area, applying relevant mitigation measures on a case-by-case basis.
(4) Circular economy	Consider and minimize the amount of composite waste from wind turbine blades at their end of life (carbon and glass fibres).
(5) Pollution	Consider and manage the risk of noise pollution and pollution to air, land and water (including marine, freshwater and groundwater) environments arising from activities related to the construction, operation/maintenance and decommissioning of equipment.
(6) Ecosystems	Consider and minimize the following impacts: — collision risk of birds and bats with wind turbine rotor blades or associated infrastructures such as overhead cables; — disturbance and displacement effects on birds and other species or habitat loss or degradation; — visual impacts, as part of the EIA or similar national guidance; — the wind farm on the landscape is prepared for projects planned within a range visible from the coast or visible to nearby communities (e.g. by computer simulation or photomontage).

Table 18 — Production of electricity from ocean energy

Sector classification and activity	
Macro-sector	Renewable energy and energy efficiency
Description	Construction and operation of electricity generation facilities that produce electricity from ocean energy
Sector criteria	
Potential environmental benefits	Supports a transition to a low-carbon economy. Avoids lock-in of technologies which do not support the transition to a low-carbon economy. Ensures that economic activities meet best practices. Ensures equal comparability within an economic activity with regards to achieving low-carbon economy target. Incorporates technology-specific considerations into secondary metrics and thresholds, where necessary.

Table 18 *(continued)*

Environmental performance indicators	A carbon footprint study in accordance with ISO 14067 shall be performed. Environmental performance indicators can include: — gCO_2e/kWh based on ISO 14067 for a specified lifetime; — the number of native fish species and their stocks before the construction and during the operation of turbines.
Rationale	
The electricity supply sector plays a critical role in the transition to a low-carbon and net-zero CO_2e energy future, which may be achieved across the whole grid. The power system is a social infrastructure system that is the foundation in all countries and regions. Electricity production based on renewable energy (bioenergy, geothermal power, hydropower, CSP, solar PV technology, wind energy and ocean energy, etc.) leads to direct and indirect GHG emission reductions. These renewable technologies provide opportunities to build smart electricity networks for low-carbon energy and could be implemented in developed and developing countries as well as in large and small cities.	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
The main potential significant harm to other environmental objectives from ocean energy is associated with: — construction, deployment, operation and maintenance of ocean energy installations that can impact marine ecosystems and biodiversity; — pollution from lubricants and anti-fouling paints and emissions from maintenance and inspection vessels.	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under “sector criteria” above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.
(3) Water	Not applicable
(4) Circular economy	Not applicable
(5) Pollution	Measures in place to minimize toxicity of anti-fouling paint and biocides.
(6) Ecosystems	For operations located in a protected area, or which include activities outside a protected area but likely to have a significant negative impact on its biodiversity, ensure that an appropriate assessment based on the conservation objectives of the protected area has been conducted in conformity with one of the following: — IFC Performance Standard 6, *Biodiversity Conservation and Sustainable Management of Living Natural Resources*; — an equivalent national standard. For such operations, a site-level biodiversity management plan shall be implemented.

Table 19 — Production of electricity from hydropower

Sector classification and activity	
Macro-sector	Renewable energy and energy efficiency
Description	Construction and operation of electricity generation facilities that produce electricity from hydropower
Sector criteria	
Potential environmental benefits	Supports a transition to a low-carbon economy. Avoids lock-in of technologies which do not support the transition to a low-carbon economy. Ensures that economic activities meet best practices. Ensures equal comparability within an economic activity with regards to achieving low-carbon economy targets. Where necessary, incorporates technology-specific considerations into secondary metrics and thresholds.
Environmental performance indicators	A carbon footprint study in accordance with ISO 14067 shall be performed. However, existing hydropower facilities are exempt from this requirement. Environmental performance indicators can include: — gCO_2e/kWh for a specified lifetime; — the number of native fish species and their stocks before the construction and during the operation of turbines. Investments which improve the capacity of a hydropower facility, without enlarging any reservoirs are eligible. Inclusion of the IHA GHG Reservoir tool[26] for reporting on the carbon footprint of a given reservoir.
Rationale	
The electricity supply sector plays a critical role in the transition to a low-carbon and net-zero CO_2e energy future, which may be achieved across the whole grid. The power system is a social infrastructure system that is the foundation in all countries and regions. Electricity production based on renewable energy (bioenergy, geothermal power, hydropower, CSP, solar PV technology, wind energy and ocean energy, etc.) leads to direct and indirect GHG emission reductions. These renewable technologies provide opportunities to build smart electricity networks for low-carbon energy and could be implemented in developed and developing countries as well as in large and small cities.	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
Construction phase impacts: Ensure that the river catchment assessment (conducted in consultation with local interested parties) shows no significant adverse impacts on upstream and downstream quantitative and qualitative water resources and uses. Implementation of a catchment management plan (with relevant interested parties) to minimize and mitigate impacts identified in the assessment. Integration of the Hydropower Sustainability Assessment Protocol (HSAP)[23] or ESG Gap Analysis Tool[22] as the key benchmark for projects.	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under “sector criteria” above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation (see Clauses A.5 and A.6).
(3) Water	Construction phase impacts: Ensure that the river catchment assessment (conducted in consultation with local interested parties) shows no significant adverse impacts on upstream and downstream quantitative and qualitative water resources and uses. Implementation of a catchment management plan (with relevant interested parties) to minimize and mitigate impacts identified in the assessment.
(4) Circular economy	Minimize construction-related waste and ensure appropriate recycling/treatment for waste generated.

Table 19 *(continued)*

(5) Pollution	Maintain the quality of the waters that protects and supports fish life, aquatic habitats and recreational uses. Projects shall be evaluated on their capacity to avoid, mitigate and compensate their impacts. Parameters and acceptable limits/ranges and necessary sampling and measuring frequency are found in relevant standards.
(6) Ecosystems	For operations located in a protected area, or which include activities outside a protected area but likely to have a significant negative impact on its biodiversity, ensure that an appropriate assessment based on the conservation objectives of the protected area has been conducted in conformity with one of the following: — IFC Performance Standard 6, *Biodiversity Conservation and Sustainable Management of Living Natural Resources*; — an equivalent national standard. For such operations, a site-level biodiversity management plan shall be implemented.

Table 20 — Production of electricity from geothermal

Sector classification and activity	
Macro-sector	Renewable energy and energy efficiency
Description	Construction and operation of electricity generation facilities that produce electricity from geothermal
Sector criteria	
Potential environmental benefits	Supports a transition to a low-carbon economy. Avoids lock-in of technologies which do not support the transition to a low-carbon economy. Ensures that economic activities meet best practices. Ensures equal comparability within an economic activity with regards to achieving low-carbon economy targets. Where necessary, incorporates technology-specific considerations into secondary metrics and thresholds.
Environmental performance indicators	A carbon footprint study in accordance with ISO 14067 shall be performed. The environmental performance indicator is gCO_2e/kWh based on ISO 14067 for a specified lifetime. Any electricity generation technology can be included in the taxonomy if it can be demonstrated, in accordance with ISO 14067 by LCA, that the life cycle impacts for producing 1 kWh of electricity are at or below the threshold. A full LCA shall be applied, using project specific data where relevant, and shall be subjected to review, however existing geothermal facilities are exempt from performing an LCA, and this exemption is subject to regular review in accordance with the threshold. CHP are covered under construction and operation of a facility used for cogeneration of heat/cooling and power threshold.
Rationale	
The electricity supply sector plays a critical role in the transition to a low-carbon and net-zero CO_2e energy future, which may be achieved across the whole grid. The power system is a social infrastructure system that is the foundation in all countries and regions. Electricity production based on renewable energy (bioenergy, geothermal power, hydropower, CSP, solar PV technology, wind energy and ocean energy, etc.) leads to direct and indirect GHG emission reductions. These renewable technologies provide opportunities to build smart electricity networks for low-carbon energy and could be implemented in developed and developing countries as well as in large and small cities.	

Table 20 *(continued)*

DNSH assessment (to evaluate impacts that are not the core environmental objective)	
The main potential significant harm to other environmental objectives from production of electric energy from high-enthalpy geothermal system is associated with the following: — Non-condensable geothermal gases with specific environmental threats, such as H_2S, CO_2, and CH_4, are often released from flash-steam and dry-steam power plants. Binary plants ideally represent closed systems and no steam is emitted. — Possible emissions to surface and underground water.	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under "sector criteria" above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.
(3) Water	Activity should minimize risks related to local water quality or local water consumption during construction, operation and decommission phases of the activity. Thermal anomalies associated with the discharge of waste heat should not exceed 3 K for groundwater environments or 1,5 K for surface water environments.
(4) Circular economy	Not applicable
(5) Pollution	Emissions to air and discharges of water: the operations of high-enthalpy geothermal energy systems should ensure that adequate abatement systems are in place to comply with BAT.
(6) Ecosystems	For operations located in a protected area, or which include activities outside a protected area but likely to have a significant negative impact on its biodiversity, ensure that an appropriate assessment based on the conservation objectives of the protected area has been conducted in conformity with one of the following: — IFC Performance Standard 6, *Biodiversity Conservation and Sustainable Management of Living Natural Resources*; — an equivalent national standard. For such operations, a site-level biodiversity management plan shall be implemented.

Table 21 — Production of electricity from gas combustion

Sector classification and activity	
Macro-sector	Renewable energy and energy efficiency
Description	Construction and operation of electricity generation facilities that produce electricity from gas combustion to replace high carbon intensity electricity production
Sector criteria	
Potential environmental benefits	Supports a transition to a low-carbon economy. Avoids lock-in of technologies which do not support the transition to a low-carbon economy. Ensures that economic activities meet best practices. Ensures equal comparability within an economic activity with regards to achieving low-carbon economy targets. Where necessary, incorporates technology-specific considerations into secondary metrics and thresholds.
Environmental performance indicators	A carbon footprint study in accordance with ISO 14067 shall be performed. Any electricity generation technology can be included in the taxonomy if it can be demonstrated, in accordance with ISO 14067 by LCA, that the life cycle impacts for producing 1 kWh of electricity are at or below the threshold. A full LCA shall be applied, using project specific data where relevant, and shall be subjected to review. However, CHP are covered under the construction and operation of a facility used for cogeneration of heat/cooling and power threshold.

Table 21 *(continued)*

Rationale	
The electricity supply sector plays a critical role in the transition to a low-carbon and net-zero CO_2e energy future, which may be achieved across the whole grid. The power system is a social infrastructure system that is the foundation in all countries and regions, and the phases of variable renewable energy integration are also quite different depending on national situations. Electricity production based on renewable energy (bioenergy, geothermal power, hydropower, CSP, solar PV technology, wind energy and ocean energy, etc.) leads to direct and indirect GHG emission reductions. These renewable technologies provide opportunities to build smart electricity networks for low-carbon energy and could be implemented in developed and developing countries as well as in large and small cities. Supports a transition to a low-carbon economy through: — avoiding lock-in technologies which do not support the transition to a low-carbon economy; — ensuring economic activities meet best practices; — ensuring equal comparability within an economic activity with regards to achieving low-carbon economy targets; — providing flexibility to support the integration of variable renewable energy (VRE); — where necessary, incorporates technology-specific considerations into secondary metrics and thresholds.	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
The key environmental aspects to be taken into account when investing in this activity are the impact on local water (consumption and sewage), the fulfilment of the applicable waste and recycling criteria, the NO_x and CO emissions control in line with indicators, and the avoidance of direct impacts on sensitive ecosystems, species or habitats.	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described in “sector criteria” above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.
(3) Water	Activity should minimize risks related to local water quality or local water consumption during construction, operation and decommissioning phases of the activity. For operations situated in areas of water scarcity, ensure that water use/conservation management plans, developed in consultation with relevant (local) interested parties, have been developed and implemented.
(4) Circular economy	Ensure appropriate measures are in place to minimize and manage waste and material use for large combustion plants.
(5) Pollution	Ensure emissions to air of NO_x and CO and discharges to water are within best practice ranges for large combustion plants and medium combustion plants. CCS can lead to important increases in emissions of certain pollutants such as NH_3, NO_x and PM. — Particulate matter (PM) and nitrogen oxide (NO_x) emissions are expected to increase in line with the amount of the additional fuel consumed if no additional measures to reduce emissions are installed. — Ammonia (NH_3) is expected to increase significantly (factor of 3) due to the degradation of the amine-based solvents used to capture the CO_2. Mitigation measures specific to these emissions shall be put in place in CCS facilities which enable the GHG emission threshold to be met.
(6) Ecosystems	For operations located in a protected area, or which include activities outside a protected area but likely to have a significant negative impact on its biodiversity, ensure that an appropriate assessment based on the conservation objectives of the protected area has been conducted in conformity with one of the following: — IFC Performance Standard 6, *Biodiversity Conservation and Sustainable Management of Living Natural Resources*; — an equivalent national standard. For such operations, a site-level biodiversity management plan shall be implemented.

Table 22 — Production of electricity from bioenergy

Sector classification and activity	
Macro-sector	Renewable energy and energy efficiency
Description	Construction and operation of electricity generation facilities that produce electricity from bioenergy
Sector criteria	
Potential environmental benefits	Supports a transition to a low-carbon economy. Avoids lock-in of technologies which do not support the transition to a low-carbon economy. Ensures that economic activities meet best practices. Ensures equal comparability within an economic activity with regards to achieving low-carbon economy targets. Where necessary, incorporates technology-specific considerations into secondary metrics and thresholds. Potential negative impacts: — land use change (LUC), indirect land use change (iLUC) and use of mineral fertilizers leading to net GHG emissions (see ISO 14067); — risk for food security; — biodiversity loss; — use of pesticides causing pollution in air, soil and water; — competition between food production and biofuel; — over-fertilization; — lack of agriculture diversity.
Environmental performance indicators	A carbon footprint study in accordance with ISO 14067 shall be performed. Environmental performance indicators can include: — carbon footprint of the supply of the biofuel measured as kg CO_2e/MJ; — gCO_2e/kWh for electricity generation; — increases or decreases in carbon stocks, measured as tonnes CO_2e/ha per annum. Metrics: Emissions in mg/Nm^3 (for biomass in large combustion plants: SO_2, NO_x, dust, CO, mercury, HCl, HF; for biomass and for liquid biofuels in medium combustion plants: SO_2, NO_x, dust, for biogas in medium combustion plants: SO_2, NO_x).
Rationale	
ISO 13065 provides a first basis of sustainability aspects which are of relevance for this sector. In addition, there are many certification schemes which have developed requirements, criteria and indicators which can also be used in this case. To these criteria, the following items should be explored, as biomaterials should have a low-indirect land use change risk (demonstrated, for example, by a roundtable for sustainable biomaterials (RSB) low-iLUC risk certificate). The electricity supply sector plays a critical role in the transition to a low-carbon and net-zero CO_2e energy future, which may be achieved across the whole grid. The power system is a social infrastructure system that is the foundation in all countries and regions. Electricity production based on renewable energy (bioenergy, geothermal power, hydropower, CSP, solar PV technology, wind energy and ocean energy, etc.) leads to direct and indirect GHG emission reductions. These renewable technologies provide opportunities to build smart electricity networks for low-carbon energy and could be implemented in developed and developing countries as well as in large and small cities.	

Table 22 *(continued)*

DNSH assessment (to evaluate impacts that are not the core environmental objective)	
The key environmental aspects to be taken into account when investing in this activity are the impact on local water (consumption and sewage), the fulfilment of the applicable waste and recycling criteria, the SO_2, NO_x dust and other emissions control and the avoidance of direct impacts on sensitive ecosystems, species or habitats. Intelligent pathways for cascading use are environmentally superior and preferable to single use. For biomass feedstocks, refer to forestry criteria or crop criteria. Potential negative impacts: — LUC, iLUC and use of mineral fertilizers leading to net GHG emissions; — risk for food security; — biodiversity loss; — use of pesticides causing pollution in air, soil and water; — competition between food production and biofuel; — over-fertilization; — lack of agriculture diversity.	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under “sector criteria” above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.
(3) Water	Activity should minimize risks related to local water quality or local water consumption during construction, operation and decommissioning phases of the activity. For operations situated in areas of water scarcity, ensure that water use/conservation management plans, developed in consultation with relevant (local) interested parties, have been developed and implemented.
(4) Circular economy	Ensure appropriate measures are in place to minimize and manage waste and material use for large combustion plants. Promote the establishment of closed waste cycles.
(5) Pollution	Do not transport feedstocks over long distances.
(6) Ecosystems	For operations located in a protected area, or which include activities outside a protected area but likely to have a significant negative impact on its biodiversity, ensure that an appropriate assessment based on the conservation objectives of the protected area has been conducted in conformity with one of the following: — IFC Performance Standard 6, *Biodiversity Conservation and Sustainable Management of Living Natural Resources*; — an equivalent national standard. For such operations, a site-level biodiversity management plan shall be implemented.

Table 23 — T&D of electricity

Sector classification and activity	
Macro-sector	Renewable energy and energy efficiency
Description	Construction and operation of transmission lines that transport the electricity on ultra high-voltage, extra high-voltage and high-voltage interconnected systems with a view to its delivery to final customers or to distributors. Construction and operation of distribution systems that transport electricity on high-voltage, medium-voltage and low-voltage distribution systems with a view to its delivery to customers. All T&D infrastructure in systems are eligible, except for infrastructure that is dedicated to directly connecting or expanding existing direct connections to production plants.

Table 23 *(continued)*

Sector criteria	
Potential environmental benefits	Supports the integration of renewable energy into the power grid. Leads to significant net GHG emission reductions, from fuel switching or merit order optimization, as a direct result of the investment. Decreases direct emissions from T&D infrastructure.
Environmental performance indicators	Environmental performance indicators can include: — gCO_2/kWh of connected production plants measured on a LCA basis.
Rationale	
Increasing access to electricity throughout countries supports its decarbonization by enabling more consumers to transition from carbon-intensive energy supply, while increasing the utilization of renewable energy. There will be fewer and fewer investments in T&D which are not climate-aligned. Under this logic, virtually all investments in electricity T&D infrastructure should be considered climate-aligned under the taxonomy. This includes investments to electric grid infrastructure which improves the overall systems architecture. The following T&D grid infrastructure-related activities are eligible: — direct connection of low-carbon electricity generation; — electric vehicle (EV) charging stations and electric infrastructure for public transport; — installation of T&D transformers that meet BAT performance criteria; — equipment 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 electrical power system and enable the development and integration of renewable energy sources, this includes: — sensors and measurement tools (including meteorological sensors for forecasting renewable production); — communication and control (including advanced software and control rooms, automation of substations or feeders, and voltage control capabilities to adapt to more decentralized renewable infeed); — equipment to carry information to users for remotely acting on consumption; — equipment to allow for exchange of renewable electricity between users; — investments covering multiple systems where the generation-weighted average emissions across all concerned systems meet the applicable threshold.	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
The impacts of T&D lines are a function of the spatial alignment of the grid, the structures and conductors required for various voltages, the extent to which pre-existing corridors are used, and how the T&D lines are operated and maintained. The most common environmental impacts of T&D of electricity lines are associated with ecosystems and land use, thus are most closely associated with protection of healthy ecosystems. In the cases of subsea offshore electricity lines, water and marine resources can be impacted.	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under “sector criteria” above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation (see see Clauses A.7 and A.8).
(3) Water	Where power lines transit rivers, avoid routings with heavy impact on marine and terrestrial ecosystems (proven by an Environmental Social Impact Assessment) and follow the principles of the IFC Environmental, Health and Safety (EHS) Guidelines[24] for construction site activities.

Table 23 *(continued)*

(4) Circular economy	Avoid breaking current or future circular economy strategies during the construction, operation and decommissioning phases of electricity transmission assets. Qualitative requirements: — implement eco-design strategies; — minimize waste generation.
(5) Pollution	Overground high-voltage lines: — for construction site activities, see the principles of the IFC EHS Guidelines[24]; — do not use polychlorinated biphenyls (PCBs).
(6) Ecosystems	Ensure an EIA, done in accordance with recognized standards and appropriate requirements, has been completed for the transmission or distribution line and any required mitigation measures for protecting biodiversity/eco-systems have been implemented. For operations located in a protected area, or which include activities outside a protected area but likely to have a significant negative impact on its biodiversity, ensure that an appropriate assessment based on the conservation objectives of the protected area has been conducted in conformity with one of the following: — IFC Performance Standard 6, *Biodiversity Conservation and Sustainable Management of Living Natural Resources*; — an equivalent national standard. For such operations, a site-level biodiversity management plan shall be implemented. Underground power lines should avoid routings with heavy impact on marine and terrestrial ecosystems (proven by an EIA) and UNESCO World Heritage Sites. See the principles of the IFC EHS Guidelines[24] for construction site activities.

Table 24 — Storage of energy

Sector classification and activity	
Macro-sector	Renewable energy and energy efficiency
Description	Construction and operation of facilities that store electricity, heat or renewable energy, and return it at a later time, in the form of electricity or other energy vectors. This does not include demand side management (load shedding and load shifting).
Sector criteria	
Potential environmental benefits	Power grid stabilization: making best use of excess renewable energy. The effective utilization of peak generation renewable energy.
Environmental performance indicators	Not applicable
Rationale	
Energy storage that stores renewable energy as electricity or heat is eligible. Electricity storage can support the integration of renewable energy systems into electricity T&D. It can balance centralized and distributed electricity generation, while also contributing to energy security. It will supplement demand response and flexible generation and complement grid development. It can also contribute to the decarbonization of other economic sectors and support the integration of higher shares of variable renewable energy (variable RES) in transport, buildings or industry.	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
Energy storage activities differ considerably in their physical, chemical and biological bases and forms, which result in divergent environmental impacts in each case.	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under “sector criteria” above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.

Table 24 *(continued)*

(3) Water	The activity should minimize risks related to local water quality or local water consumption during construction, operation and decommissioning phases of the activity.
(4) Circular economy	Avoid breaking current or future circular economy strategies during construction, operation and decommissioning phases of electricity transmission assets. Qualitative requirements: — implement eco-design strategies; — minimize waste generation.
(5) Pollution	Avoid leakage of hazardous substances such as fluorinated compounds and organic solvents contained in an electrolytic solution from manufacturing processes.
(6) Ecosystems	For operations located in a protected area, or which include activities outside a protected area but likely to have a significant negative impact on its biodiversity, ensure that an appropriate assessment based on the conservation objectives of the protected area has been conducted in conformity with one of the following: — IFC Performance Standard 6, *Biodiversity Conservation and Sustainable Management of Living Natural Resources*; — an equivalent national standard. For such operations, a site-level biodiversity management plan shall be implemented.

Table 25 — Manufacture of biomass, biogas or biofuels

Sector classification and activity	
Macro-sector	Renewable energy and energy efficiency
Description	Manufacture of biomass, biogas or biofuels
Sector criteria	
Potential environmental benefits	Reduce the risk of iLUC. Manufacture of all biomass, biogas or biofuels should deliver robust climate benefits compared to fossil fuels.
Environmental performance indicators	Environmental performance indicators can include: — kg/CO_2e/t biomass fuel product (e.g. wood pellets); — kg/CO_2e/MJ for biogas or biofuels; — increases or decreases in carbon stocks, measured as tonnes CO_2e/ha per annum.
Rationale	
The use of biomass, biogas and biofuel has the potential to be a key mitigation technology but, if done poorly, can have no net positive impact or even a negative impact. The manufacture of biomass, biogas and biofuels can have adverse environmental impacts. There are many certification schemes that address sustainability concerns which can also be used in this case. Production of biomass, biogas and biofuels is eligible if produced from advanced bioenergy feedstock and certified low-iLUC fuels. If primary forest-related feedstock is used, it shall be produced in economic activities fulfilling the afforestation and reforestation, or rehabilitation and existing forest management criteria.	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
The key environmental aspects to be taken into account when investing in this activity are the impact on local water (consumption and sewage), the fulfilment of the applicable waste and recycling criteria, and the avoidance of direct impacts on sensitive ecosystems, species or habitats. For biomass feedstocks, refer to forestry criteria or crop criteria.	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under “sector criteria” above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.

Table 25 *(continued)*

(3) Water	Activity should minimize risks related to local water quality or local water consumption during construction, operation and decommissioning phases of the activity. For operations situated in areas of water scarcity, ensure that water use/conservation management plans, developed in consultation with relevant (local) interested parties, have been developed and implemented.
(4) Circular economy	For biogas production: The resulting digestate meets the requirements for fertilizing materials on fertilizers/soil improvers for agricultural use.
(5) Pollution	For biogas production: apply a gas-tight cover on the digestate storage.
(6) Ecosystems	Production of biomass, biogas and biofuels using primary forest-related feedstock shall use feedstock that was produced fulfilling the DNSH criteria given under the afforestation and reforestation, or rehabilitation and existing forest management activities. Production of biomass, biogas and biofuels using crop feedstock shall use feedstock that was produced fulfilling the DNSH criteria given under the growing of perennial crops or growing of non-perennial crops activities. For operations located in a protected area, or which include activities outside a protected area but likely to have a significant negative impact on its biodiversity, ensure that an appropriate assessment based on the conservation objectives of the protected area has been conducted in conformity with one of the following: — IFC Performance Standard 6, *Biodiversity Conservation and Sustainable Management of Living Natural Resources*; — an equivalent national standard. For such operations, a site-level biodiversity management plan shall be implemented.

Table 26 — Retrofit of gas T&D networks

Sector classification and activity	
Macro-sector	Renewable energy and energy efficiency
Description	Retrofit of gas networks for the distribution of gaseous fuels through a system of mains and for long-distance transportation of gas by pipelines
Sector criteria	
Potential environmental benefits	Significant net GHG emission reductions by reducing leakage and increasing the volume of hydrogen and other lower-carbon gases used in the gas system.
Environmental performance indicators	Retrofit of gas T&D networks to repurpose them for the transport of hydrogen and other lower-carbon gases are eligible: — any gas transmission or distribution network investment which enables the network to increase the blend of hydrogen or other lower-carbon gases in the gas system; — the repair of existing gas pipelines for the reduction of methane leakage is eligible if the pipelines are hydrogen-ready or other lower-carbon gases. Retrofit of gas networks whose main purpose is to serve the storage or utilization of captured CO_2 is eligible, if the operation of the pipeline meets the criteria outlined for the transportation of captured CO_2.
Rationale	
Electrification of the energy sector will not be sufficient to meet the requirements of the low-carbon economy by 2050. Molecule-based energy will continue to have a role to play in the future energy supply. This is particularly pertinent to supporting the uptake of hydrogen, which has an enormous capacity to decarbonize the electricity, transport and manufacturing sectors. If crop feedstock is used, it shall be produced in economic activities fulfilling the growing of perennial crops or the growing of non-perennial crops criteria (see Table 1).	

Table 26 *(continued)*

DNSH assessment (to evaluate impacts that are not the core environmental objective)	
The main potential significant harm to other environmental objectives from retrofits and operation of existing gas distribution and supply networks that allow for the use of hydrogen is associated with the following: — Construction phase of the network: all aspects have to be considered that are usually connected with construction (i.e. terrestrial habitat alteration, loss of valuable ecosystems, land consumption, overburden disposal, negative impacts on biodiversity, emissions of particulate matter and NO_x, noise and hazardous materials). For larger projects, an EIA should be done. — Operation phase: Leakage should be kept at a minimum. Underground networks can have an impact on ground water systems and on local ecosystems.	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under “sector criteria” above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.
(3) Water	The activity should minimize risks related to local water quality or local water consumption during construction, operation and decommissioning phases of the activity. A minimum requirement is the implementation and adherence to a recognized environmental management system (e.g. ISO 14001 or equivalent). For construction site activities, see the principles of the IFC EHS Guidelines[24].
(4) Circular economy	Ensure appropriate measures are in place to minimize and manage waste and material use in construction and decommissioning phases.
(5) Pollution	A minimum requirement is the implementation and adherence to a recognized environmental management system (e.g. ISO 14001 or equivalent). Fans, compressors, pumps and other equipment should adhere to eco-design principles and be as efficient as possible to reduce electricity consumption and associated emissions.
(6) Ecosystems	Ensure an EIA has been completed for retrofit and operation of existing gas distribution and supply networks that allow for the use of hydrogen systems on site. This shall include ancillary services (e.g. transport infrastructure and operations, waste disposal facilities). For operations located in a protected area, or which include activities outside a protected area but likely to have a significant negative impact on its biodiversity, ensure that an appropriate assessment based on the conservation objectives of the protected area has been conducted in conformity with one of the following: — IFC Performance Standard 6, *Biodiversity Conservation and Sustainable Management of Living Natural Resources*; — an equivalent national standard. For such operations, a site-level biodiversity management plan shall be implemented.

Table 27 — District heating/cooling distribution

Sector classification and activity	
Macro-sector	Renewable energy and energy efficiency
Description	District heating/cooling distribution
Sector criteria	
Potential environmental benefits	Supports a transition to a low-carbon economy. Avoids lock-in of technologies which do not support the transition to a low-carbon economy. Ensures that economic activities meet best practices, including the use of best available climate refrigerants. Ensures equal comparability within an economic activity with regards to achieving low-carbon economy targets.
Environmental performance indicators	Environmental performance indicators can include: — per cent (%) share of energy use of district heating or cooling system that comes from renewable energy, waste heat and heat recovery systems, cogenerated heat, and a combination of such energy and heat; — CoP of heat pumps; — GWP of refrigerant use by heat pumps.
Rationale	
Providing energy services in a low-carbon manner, particularly for heating and cooling distribution will require investments in newer and more efficient delivery models. Because district heating and cooling is a large-scale system that provides heating and cooling for multiple buildings, renewable energy (e.g. heat from ambient air, groundwater, seawater, river water, sewage) can be collected on a large scale. Electric heat pumps can utilize those renewable energies for efficient heating and cooling. Since the installation of the system that collects renewable energy on a large scale in a small or medium-sized stand-alone building is difficult, district heating and cooling operators should actively install electric heat pumps that can utilize renewable energy.	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
Key environmental aspects to be considered for the investments in the distribution of district level heating and cooling are summarized as follows. For the construction of the mains, the potential significant harms are connected to facility construction in general. This includes, among other things, terrestrial habitat alteration, loss of valuable ecosystem services, land consumption, overburden disposal systems, negative effects on biodiversity, emissions of particulate matter and NO_x, noise and hazardous materials. For the operation of district heating networks, the potential significant impacts are considered low. They relate mainly to the potential impact of underground district heating networks on drinking water/ground water systems and local ecosystems caused by corrosion of distribution system elements and water additives that can be non-biodegradable.	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under “sector criteria” above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.
(3) Water	For the operation of the district heating and cooling networks, consider the release of pollutants cause by corrosion of the mains as well as the use of water and marine resources. For construction site activities related to construction of the mains, see the principles of the IFC EHS Guidelines[24].
(4) Circular economy	Avoid that construction, operation and decommissioning of district heating systems undermine the relevant circular economy, waste prevention or recycling strategies of the relevant country/region.

Table 27 *(continued)*

(5) Pollution	Consider pollution from corrosion products resulting from corrosion of the distribution systems, bacteria, applied water additives and their reactants. Fans, compressors, pumps and other equipment should adhere to eco-design principles and be as efficient as possible to reduce electricity consumption and associated emissions.
(6) Ecosystems	Follow the principles of IFC Performance Standard 6. Ensure that the distribution system routing is as short as possible and does not pass through vulnerable local ecosystems including protected areas, UNESCO World Heritage Sites and KBAs.

Table 28 — Installation and operation of electric heat pumps

Sector classification and activity	
Macro-sector	Renewable energy and energy efficiency
Description	Installation and operation of electric heat pumps
Sector criteria	
Potential environmental benefits	Supports a transition to a low-carbon economy. Avoids lock-in of technologies which do not support the transition to a low-carbon economy. Ensures that economic activities meet best practices, including the use of best available climate refrigerants. Ensures equal comparability within an economic activity with regards to achieving low-carbon economy targets. Where necessary, incorporates technology-specific considerations into secondary metrics and thresholds.
Environmental performance indicators	Environmental performance indicators can include: — CoP (amount in kilowatts of heat produced from 1 kw of electrical energy); — GWP of refrigerant use by heat pumps. When electric heat pumps are operated with a renewable power source, CoP does not need to be applied.
Rationale	
Electric heat pumps are eligible when: — they utilize renewable sources of electricity; — cogeneration systems use biofuels and hydrogen fuels. Providing energy services in a low-carbon manner, particularly for heating and cooling distribution, will require investments in newer and more efficient delivery models. Electric heat pumps are an energy efficient heating/cooling method. Electric heat pumps will play an important role in the decarbonization efforts. Electric heat pumps can use renewable energy (e.g. heat from ambient air, groundwater, seawater, river water, sewage) as a heat source to produce cold and heat. When electric heat pumps are powered by renewable energy sources such as solar or wind, cooling and heating can be done without producing CO_2. Electric heat pumps can be used not only for heating and cooling, but also for hot water supply, industrial refrigeration and heating, and have a wide range of applications. Therefore, electric heat pumps should be actively promoted. When used with a thermal storage system, electric heat pumps can regulate their power consumption by storing or dissipating the heat produced for air conditioning purposes. This will contribute to the stabilization of the power grid, as well as to the effective use of renewable energy sources, in the same way as storage batteries. The CoP is an average measurement showing the effectiveness of electric heat pumps on an annual basis.	

Table 28 *(continued)*

DNSH assessment (to evaluate impacts that are not the core environmental objective)	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under "sector criteria" above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.
(3) Water	The activity should minimize risks related to local water quality or local water consumption during construction, operation and decommissioning phases of the activity.
(4) Circular economy	Ensure appropriate measures are in place to minimize and manage waste and material use.
(5) Pollution	Avoid using substances that deplete the ozone layer specified by the Montreal Protocol on Substances that Deplete the Ozone Layer[31] as refrigerants.
(6) Ecosystems	For operations located in a protected area, or which include activities outside a protected area but likely to have a significant negative impact on its biodiversity, ensure that an appropriate assessment based on the conservation objectives of the protected area has been conducted in conformity with one of the following: — IFC Performance Standard 6, *Biodiversity Conservation and Sustainable Management of Living Natural Resources*; — an equivalent national standard. For such operations, a site-level biodiversity management plan shall be implemented.

Table 29 — Cogeneration of heat/cooling and power from CSP

Sector classification and activity	
Macro-sector	Renewable energy and energy efficiency
Description	Cogeneration of heat/cooling and power from CSP
Sector criteria	
Potential environmental benefits	Supports a transition to a low-carbon economy. Avoids lock-in of technologies which do not support the transition to a low-carbon economy. Ensures that economic activities meet best practices. Ensures equal comparability within an economic activity with regards to achieving low-carbon economy targets.
Environmental performance indicators	A carbon footprint study in accordance with ISO 14067 should be performed for electricity generation. The environmental performance indicators are: — CoP; — carbon intensity of power generation: $gCO_2e/kWh(e)$; — carbon intensity of heat generation: $gCO_2e/kWh(th)$; — weighted carbon intensity: $CO_2e/kWh(th+e)$.
Rationale	
Efficient and low emission cogeneration of heating/cooling and power is required for decarbonization by 2050. Production of heat/cooling using waste heat as defined by the energy efficiency best practices is eligible.	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
The main potential significant harm to other environmental objectives from CSP is associated with: — the construction of the installation and the substantial land take associated with the installation; — impacts to birdlife from the high temperatures generated by the plant.	

Table 29 *(continued)*

(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under "sector criteria" above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.
(3) Water	For CSP technologies that require water and are located in areas of water scarcity, ensure that water use/conservation management plans, developed in consultation with relevant (local) interested parties, have been developed and implemented.
(4) Circular economy	Not applicable
(5) Pollution	Not applicable
(6) Ecosystems	For operations located in a protected area, or which include activities outside a protected area but likely to have a significant negative impact on its biodiversity, ensure that an appropriate assessment based on the conservation objectives of the protected area has been conducted in conformity with one of the following: — IFC Performance Standard 6, *Biodiversity Conservation and Sustainable Management of Living Natural Resources*; — an equivalent national standard. For such operations, a site-level biodiversity management plan shall be implemented.

Table 30 — Cogeneration of heat/cooling and power from geothermal energy

Sector classification and activity	
Macro-sector	Renewable energy and energy efficiency
Description	Construction and operation of a facility used for construction and operation of a facility used for cogeneration of heat/cooling and power from geothermal energy
Sector criteria	
Potential environmental benefits	Supports a transition to a low-carbon economy. Avoids lock-in of technologies which do not support the transition to a low-carbon economy. Ensures that economic activities meet best practices. Ensures equal comparability within an economic activity with regards to achieving low-carbon economy targets.
Environmental performance indicators	A carbon footprint study in accordance with ISO 14067 shall be performed for electricity generation. Environmental performance indicators can include: — carbon intensity of power generation: gCO_2e/kWh(electric); — carbon intensity of heat generation: gCO_2e/kWh(thermal).
Rationale	
Efficient and low emission cogeneration of heat/cooling and power will be required for decarbonization by 2050.	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
The main potential significant harm to other environmental objectives from production of CHP from high-enthalpy geothermal system is associated with the following: — Non-condensable geothermal gases with specific environmental threats, such as H_2S, CO_2 and CH_4, are often released from flash-steam and dry-steam power plants. Binary plants ideally represent closed systems and no steam is emitted. — Possible emissions to surface and underground water.	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under "sector criteria" above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.

Table 30 *(continued)*

(3) Water	Activity should minimize risks related to local water quality or local water consumption during construction, operation and decommissioning phases of the activity. Thermal anomalies associated with the discharge of waste heat to groundwater and surface water environments should be minimized.
(4) Circular economy	Ensure appropriate measures are in place to minimize and manage waste and material use.
(5) Pollution	Not applicable
(6) Ecosystems	For operations located in a protected area, or which include activities outside a protected area but likely to have a significant negative impact on its biodiversity, ensure that an appropriate assessment based on the conservation objectives of the protected area has been conducted in conformity with one of the following: — IFC Performance Standard 6, *Biodiversity Conservation and Sustainable Management of Living Natural Resources*; — an equivalent national standard. For such operations, a site-level biodiversity management plan shall be implemented.

Table 31 — Cogeneration of heat/cooling and power from gas combustion

Sector classification and activity	
Macro-sector	Renewable energy and energy efficiency
Description	Construction and operation of a facility used for cogeneration of heat/cooling and power from gas combustion (not exclusive to natural gas)
Sector criteria	
Potential environmental benefits	Supports a transition to a low-carbon economy. Avoids lock-in of technologies which do not support the transition to a low-carbon economy. Ensures that economic activities meet best practices. Ensures equal comparability within an economic activity with regards to achieving low-carbon economy targets.
Environmental performance indicators	A carbon footprint study in accordance with ISO 14067 shall be performed for electricity generation. The environmental performance indicators are: — CoP in an electric system; — carbon intensity of power generation: gCO_2e/kWh(electric); — carbon intensity of heat generation: gCO_2e/kWh(thermal). Any CHP generation technology is eligible if it can be demonstrated, in accordance with ISO 14067, that the facility is operating at less than the weighted cogeneration threshold.
Rationale	
Efficient and low emission cogeneration of heat/cooling and power will be required for decarbonization by 2050.	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
The key environmental impacts to be taken into account when investing in this activity are the impact on local water (consumption of resource and water pollution), applicable waste and recycling criteria, prevention and control of air pollution, and the avoidance of direct impacts on sensitive ecosystems, species or habitats.	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under “sector criteria” above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.

Table 31 *(continued)*

(3) Water	Activity should minimize risks related to local water quality or local water consumption during construction, operation and decommissioning phases of the activity. For operations situated in areas of water scarcity, ensure that water use/conservation management plans, developed in consultation with relevant (local) interested parties, have been developed and implemented.
(4) Circular economy	Ensure appropriate measures are in place to minimize and manage waste and material use in accordance with for large combustion plants.
(5) Pollution	Ensure emissions to air of NO_x and CO and discharges to water are within the ranges set for large combustion plants and medium combustion plants.
(6) Ecosystems	For operations located in a protected area, or which include activities outside a protected area but likely to have a significant negative impact on its biodiversity, ensure that an appropriate assessment based on the conservation objectives of the protected area has been conducted in conformity with one of the following: — IFC Performance Standard 6, *Biodiversity Conservation and Sustainable Management of Living Natural Resources*; — an equivalent national standard. For such operations, a site-level biodiversity management plan shall be implemented.

Table 32 — Cogeneration of heat/cooling and power from bioenergy

Sector classification and activity	
Macro-sector	Renewable energy and energy efficiency
Description	Construction and operation of a facility used for cogeneration of heat/cooling and power from bioenergy
Sector criteria	
Potential environmental benefits	Supports a transition to a low-carbon economy. Avoids lock-in of technologies which do not support the transition to a low-carbon economy. Ensures that economic activities meet best practices. Ensures equal comparability within an economic activity with regards to achieving low-carbon economy targets. If a CHP plant produces electricity and heat, it shall apply a weighted heat and power threshold, based on the relative production of heat and power.
Environmental performance indicators	A carbon footprint study in accordance with ISO 14067 shall be performed for electricity generation. The environmental performance indicators are: — carbon intensity of power generation: gCO_2e/kWh(electric); — carbon intensity of heat generation: gCO_2e/kWh(thermal).
Rationale	
Efficient and low emission cogeneration of heat/cooling and power will be required to meet its low-carbon target by 2050.	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
The key environmental aspects to be taken into account when implementing this activity are the impact on local water (consumption and sewage), the fulfilment of the applicable waste and recycling criteria, emissions of SO_2, NO_x, dust and the avoidance of direct impacts on sensitive ecosystems, species or habitats. Biomass-based electricity should be eligible only if produced through the following technologies: biomass, biogas or biofuels. For biomass feedstocks, refer to forestry criteria or crop criteria.	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under “sector criteria” above.

Table 32 *(continued)*

(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.
(3) Water	Activity should minimize risks related to local water quality or local water consumption during construction, operation and decommissioning phases of the activity. For operations situated in areas of water scarcity, ensure that water use/conservation management plans, developed in consultation with relevant (local) interested parties, have been developed and implemented.
(4) Circular economy	Not applicable
(5) Pollution	Do not transport feedstocks over long distances. Metrics include emissions in mg/Nm^3 (for biomass: SO_2, NO_x, dust, CO, mercury, HCl, HF; for biomass and for liquid biofuels: SO_2, NO_x, dust, for biogas: SO_2, NO_x).
(6) Ecosystems	For operations located in a protected area, or which include activities outside a protected area but likely to have a significant negative impact on its biodiversity, ensure that an appropriate assessment based on the conservation objectives of the protected area has been conducted in conformity with one of the following: — IFC Performance Standard 6, *Biodiversity Conservation and Sustainable Management of Living Natural Resources*; — an equivalent national standard. For such operations, a site-level biodiversity management plan shall be implemented.

Table 33 — Cogeneration of heat/cooling and power using waste heat

Sector classification and activity	
Macro-sector	Renewable energy and energy efficiency
Description	Production of heat and cooling using waste heat
Sector criteria	
Potential environmental benefits	Supports a transition to a low-carbon economy. Avoids lock-in of technologies which do not support the transition to a low-carbon economy. Ensures that economic activities meet best practices. Ensures equal comparability within an economic activity with regards to achieving low-carbon economy targets.
Environmental performance indicators	A carbon footprint study in accordance with ISO 14067 should be performed for electricity generation. The environmental performance indicators are: — carbon intensity of power generation: gCO_2e/kWh(electric); — carbon intensity of heat generation: gCO_2e/kWh(thermal).
Rationale	
The operation of waste heat infrastructure is eligible because the emissions from the underlying economic activity would be generated with or without the waste heat recovery system. Hence, the waste heat recovery system would not increase operational emissions. All recovery of waste heat is eligible. Electric heat pumps can be highly efficient equipment that utilize waste heat from plants and cities (e.g. waste incineration plants, transformer substations, subway exhaust) as a heat source to produce heat and cooling.	

Table 33 *(continued)*

DNSH assessment (to evaluate impacts that are not the core environmental objective)	
The key environmental aspects to be taken into account when implementing this activity are the impact on local water (consumption and sewage), the fulfilment of the applicable waste and recycling criteria, emissions of SO_2, NO_x, dust and the avoidance of direct impacts on sensitive ecosystems, species or habitats. Biomass-based electricity should be eligible only if produced through the following technologies: waste of biomass, biogas or biofuels. For biomass feedstocks, refer to forestry criteria or crop criteria.	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under "sector criteria" above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.
(3) Water	Activity should minimize risks related to local water quality or local water consumption during construction, operation and decommissioning phases of the activity. For operations situated in areas of water scarcity, ensure that water use/conservation management plans, developed in consultation with relevant (local) interested parties, have been developed and implemented.
(4) Circular economy	Not applicable
(5) Pollution	Do not transport feedstocks over long distances. Metrics include emissions in mg/Nm^3 (for biomass: SO_2, NO_x, dust, CO, mercury, HCl, HF; for biomass and for liquid biofuels: SO_2, NO_x, dust, for biogas: SO_2, NO_x).
(6) Ecosystems	For operations located in a protected area or which include activities outside a protected area but likely to have a significant negative impact on its biodiversity, ensure that an appropriate assessment based on the conservation objectives of the protected area has been conducted in conformity with one of the following: — IFC Performance Standard 6, *Biodiversity Conservation and Sustainable Management of Living Natural Resources*; — an equivalent national standard. For such operations, a site-level biodiversity management plan shall be implemented.

5.4.4 Water supply, sewerage, waste management and remediation

5.4.4.1 Inclusion of water supply, sewerage, waste management and remediation activities

Advanced solid waste management has a great potential to trigger GHG emission reductions in other sectors of the economy through waste prevention, separate waste collection, waste reuse and recycling.

5.4.4.2 Inclusion of carbon capture and sequestration

Carbon capture and sequestration is a key technology for decarbonization. It is included in all pathways presented heavily in three-out-of-four scenarios outlined by the IPCC in the Special Report on 1.5 Degrees[29].

5.4.4.3 Capture

While some CO_2 capture technologies can incur an "energy penalty" of 10 % to 15 %, others do not. For example, when supercritical CO_2 is integrated fully into the power cycle as a coolant, energy and water demand are significantly reduced. It is therefore inaccurate to say that carbon capture and sequestration is always a highly energy intensive technology.

5.4.4.4 Transport and storage

Chemically, CO_2 bonds with surrounding minerals after injection (gradual re-fossilization), making CO_2 storage sites safer as time progresses.

Through decade-long CO_2 injection experiences in North America and the monitoring of CO_2 storage in Europe, the safe final disposal of CO_2 both onshore and offshore has already been established.

5.4.4.5 Water supply, sewerage, waste management and remediation areas

The taxonomy for water supply, sewerage, waste management and remediation is given in Tables 34 to 45.

Table 34 — Water collection, treatment and supply

Sector classification and activity	
Macro-sector	Water supply, sewerage, waste management and remediation
Description	Water collection, treatment and supply with high energy efficiency of the system.
Sector criteria	
Potential environmental benefits	Substantial contribution to net GHG emissions savings by reducing energy consumption in the water collection, treatment and supply system.
Environmental performance indicators	Average energy consumption of the system (including withdrawal, treatment and distribution) expressed as kwh per cubic meter billed/unbilled authorized water supply. Infrastructure Leakage Index (ILI)[30] leakage value.
Rationale	
The water supply sector is a wide and varied sector with different performance conditions depending on the water source, the necessary treatment, the topography of the supplied area, the length of the network, etc. Several energy efficiency measures can reduce the amount of energy consumed by a water supply system, enabling significant reductions of net GHG emissions, including: — using water sources that require less energy to transport (e.g. surface sources instead of groundwater sources, by means of water harvesting); — more efficient pumping systems (including variable speed drives); — flow limiting devices; — digitalization and automation. The ILI incorporates in its definition the length of the supply network, which makes it the most objective parameter. Water loss management (reduction of the ILI) indirectly reduces the energy consumption in the whole water supply system thus enabling significant reductions of net GHG emissions from the water supply system. Water loss management measures consist of, among others: — active leakage control; — pressure management; — speed and quality of repairs; — infrastructure and assets management (including maintenance); — metering; — monitoring and reporting; — digitalization and automation. NOTE The Infrastructure Leakage Index (ILI)[30] is derived from the structural and operational characteristics of the network. Some parameters, such as the length of service connections, can be difficult to estimate; furthermore, the strong dependence of ILI on the average operating pressure (AOP) makes it sensitive to the way this parameter is defined, making it potentially unsuitable for comparing different systems.	

Table 34 *(continued)*

DNSH assessment (to evaluate impacts that are not the core environmental objective)	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under “sector criteria” above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.
(3) Water	In areas of water scarcity, ensure that water use/conservation management plans, developed in consultation with relevant (local) interested parties, exist and are implemented.
(4) Circular economy	Not applicable
(5) Pollution	Not applicable
(6) Ecosystems	Protect groundwater hydrology and aquatic ecological status of surface.

Table 35 — Centralized wastewater treatment system

Sector classification and activity	
Macro-sector	Water supply, sewerage, waste management and remediation
Description	Centralized wastewater systems (including collection and treatment), substituting untreated wastewater discharge or treatment systems causing high net GHG emissions (e.g. onsite sanitation, anaerobic lagoons).
Sector criteria	
Potential environmental benefits	Net GHG emission reduction through centralization of wastewater treatment, thus substituting or avoiding decentralized sanitation systems with higher net GHG emissions.
Environmental performance indicators	Environmental performance indicators can include: — amount of treated wastewater substituting for discharge of untreated wastewater; — GHG intensity of wastewater treatment.
Rationale	
Anaerobic digestion of sewage sludge treatment is eligible provided that (cumulative): — methane leakage from biogas production is controlled by a monitoring system; — captured biogas is used for electricity/heat generation or biofuel production. Construction or extension of centralized wastewater systems including collection (sewerage network) and treatment are eligible, provided that the new wastewater treatment substitutes the untreated discharge of wastewater to the water bodies or replaces more GHG emission-intensive wastewater treatment systems. This activity considers collection and wastewater treatment associated with wastewater treatment plants. Sludge treatment is included in another taxonomy activity. From common practice (see 2006 IPCC Guidelines for National Greenhouse Gas Inventories[28]) it is known that any level of treatment (primary, secondary or tertiary) achieves significant reductions of net GHG emissions when compared with the emissions of the discharge of untreated wastewater into water bodies or other on-site sanitation systems (such as septic tanks, anaerobic lagoons, etc.).	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
Potential harm linked to centralized wastewater treatment is related to: — discharges to water from wastewater treatment; — combined sewer overflow in case of heavy rainfall; — sewage sludge treatment.	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under “sector criteria” above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.
(3) Water	Not applicable

Table 35 *(continued)*

(4) Circular economy	Not applicable
(5) Pollution	Implement appropriate measures to avoid and mitigate combined sewer overflow in case of heavy rainfall, such as nature-based solutions, separate rainwater collection systems, retention tanks and/or treatment of the first flush.
(6) Ecosystems	Not applicable

Table 36 — Anaerobic digestion of sewage sludge

Sector classification and activity	
Macro-sector	Water supply, sewerage, waste management and remediation
Description	Treatment of sewage sludge in wastewater treatment plants or in other installation with the resulting production and energetic utilization of biogas.
Sector criteria	
Potential environmental benefits	Net GHG emission reduction from sewage sludge treatment through the capture and energetic utilization (electricity/heat generation or biofuel production) of the generated biogas.
Environmental performance indicators	The environmental performance indicators are: — use of monitoring system for tracking methane leakage from biogas system; — use of captured biogas for electricity/heat production or biofuel production.
Rationale	
Sewage sludge is a by-product of wastewater treatment, with organic and inorganic content. The organic content of the sludge is subject to decomposition which can occur under controlled circumstances (in sludge treatment installations) or under uncontrolled circumstances in the final disposal, with resulting net GHG emissions (mainly methane). Anaerobic digestion (AD), and in some cases aerobic digestion, are examples of sludge treatments. In AD, microorganisms decompose the organic matter of the sludge (in the absence of oxygen) and produce methane-rich biogas. The climate mitigation effect is dual: a) biogas is a source of energy which is transformed into heat, electricity or fuel, replacing fossil fuels in electricity/heat generation and consequently avoiding net GHG emissions to air (CO_2, N_2O, etc.); b) sludge is turned into a recyclable product (e.g. as fertilizer substituting synthetic fertilizers). Sludge treatment is, in many cases, centralized in wastewater treatment plants, which treat the sludge and produce energy from sludge produced in the plant or outside the plant. Methane leakage can offset the climate mitigation benefits and therefore needs to be avoided. A monitoring system allows the detection of leakages. It is in the interest of the operator to fix detected leakages in order to minimize economic losses.	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
Sewage sludge treatment for the production of biogas can lead to emissions of pollutants that have significant impacts on human respiratory systems and on ecosystems through acidification or eutrophication, in particular ammonia emissions from the sludge storage as well as emissions resulting from the subsequent use of biogas such as sulfur dioxide, nitrous oxide and particulates. When the resulting digestate is used as a fertilizer/soil improver, there is a risk of soil pollution because of contaminants contained in the digestate. Additionally, there could be impacts on the local ecosystems where the sewage sludge treatment is carried out.	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under “sector criteria” above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.
(3) Water	Not applicable
(4) Circular economy	Not applicable

Table 36 *(continued)*

(5) Pollution	Emissions to air and water are within the ranges set for anaerobic treatment of waste and waste treatment. Emissions to air (e.g. SO_x, NO_x and particulates) after combustion of biogas are controlled and, when needed, abated.
(6) Ecosystems	Not applicable

Table 37 — Separate collection and transport of non-hazardous waste in source segregated fractions

Sector classification and activity	
Macro-sector	Water supply, sewerage, waste management and remediation
Description	Separate collection and transport of non-hazardous waste in single or comingled fractions aimed at preparing for reuse or recycling.
Sector criteria	
Potential environmental benefits	Net GHG emission reductions enabled through separate collection and transport of non-hazardous waste for subsequent substitution of virgin materials thus avoiding higher emissions from the alternative use of virgin materials (energy consumption for extraction, transport and production).
Environmental performance indicators	The environmental performance indicator is the amount of source segregated waste collected separately.
Rationale	
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 or recycling. Separate waste collection is a precondition for advanced recycling of materials. The climate mitigation net benefits of material recovery are established by pertinent studies (e.g. LCA). Collection and transport of waste includes, for example, bins, containers, vehicles, ancillary technological equipment and IT systems, reverse vending machines, services useful to separate waste collection (e.g. information campaigns, activities of waste advisers) as well as related temporary storage and transfer facilities.	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
Potential harm linked to the collection of waste in source-segregated fractions is related to: — emissions of collection vehicles; — risk of mixing source segregated waste fractions in waste storage and transfer facilities; — risk of not properly segregating hazardous components/pieces from waste.	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under “sector criteria” above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.
(3) Water	Not applicable
(4) Circular economy	Avoid mixing source-segregated waste fractions in waste storage and transfer facilities.
(5) Pollution	Not applicable
(6) Ecosystems	Not applicable

Table 38 — Anaerobic digestion of biowaste

Sector classification and activity	
Macro-sector	Water supply, sewerage, waste management and remediation
Description	Treatment of separately collected biowaste through anaerobic digestion with the resulting production and utilization of biogas and production of digestate for use as a fertilizer/soil improver, possibly after composting or any other treatment.

Table 38 *(continued)*

Sector criteria	
Potential environmental benefits	Net GHG emission reductions through avoidance of net GHG emissions compared to alternative options for biowaste management, through controlled production and utilization (electricity/heat generation or biofuel production) of biogas, and through production of digestate that can be used, possibly after composting or any other treatment, as a fertilizer/soil improver displacing synthetic fertilizers.
Environmental performance indicators	The environmental performance indicators are: — amount of source-segregated waste collected separately; — use of monitoring system for tracking methane leakage from biogas system; — production and use of captured biogas for electricity/heat production or biofuel production; — use of digestate as fertilizer/soil improver, including for composting; — the type and amount of waste used for anaerobic digestion.
Rationale	
Anaerobic digestion of biowaste is eligible provided that (cumulative): — the biowaste is collected separately; — methane leakage from biogas production is controlled by a monitoring system; — the produced biogas is used for electricity/heat generation or biofuel production; — the digestate produced is used as fertilizer/soil improver, possibly after composting or other processing; — the major share of material for anaerobic digestion is biowaste. In the case of co-digestion, other biodegradable wastes such as solid or liquid manure and other agricultural residues may be added. Anaerobic digestion (AD) is a process by which microorganisms decompose biodegradable material in the absence of oxygen. As part of an integrated waste management system, AD is a valid route to divert biodegradable waste from landfilling and thus reduce the uncontrolled emissions of landfill gas, in particular methane. The AD process produces methane-rich biogas under controlled conditions, and a sludge-like or liquid residue, termed “digestate”. Biogas can be used to drive a gas engine with connected generator to generate electricity or heat or can be incinerated to produce heat or can be further processed into bio-methane to be used as a fuel. The digestate is typically used on farmland as organic fertilizer, directly or after composting or after other processing. The use of digestate instead of synthetic fertilizers derived from by-products of the petroleum industry saves energy and reduces the consumption of fossil fuels. Where there is no immediate use on farmland, the digestate can be dewatered and “cured” by composting to stabilize the material, which can be stored for longer time and used as an organic fertilizer or soil improver. Overall, AD exhibits the best environmental performance for the treatment of separately collected biodegradable waste, where both the biogas and the digestate can be utilized (in particular when the digestate is composted). For AD to be technically viable, appropriate feedstock shall be secured in sufficiently large quantities (a rule of thumb is > 20,000 tonnes per annum (tpa) for a commercial scale plant). Besides biowastes, other biodegradable materials and wastes such as solid or liquid manure and other agricultural residues may be added to the feedstock and co-digested to improve the stability of the AD process and increase biogas yields. Biowastes with high ligneous content (such as in green garden waste) are typically not directly degradable by AD. Where such biowaste fraction is significant, it should be collected separately and treated by composting. Methane leakage can offset the climate mitigation benefits and therefore needs to be avoided. A monitoring system allows the detection of leakage. It is in the interest of the operator to fix detected leakage in order to minimize economic losses.	

Table 38 *(continued)*

DNSH assessment (to evaluate impacts that are not the core environmental objective)	
The operation of an AD plant can lead to emissions of pollutants that have significant impacts on human respiratory systems and on ecosystems through acidification or eutrophication. The most relevant emissions are ammonia emissions from the digestate storage as well as emissions resulting from the subsequent use of biogas, such as sulfur dioxide, nitrous oxide and particulates. The use of the resulting digestate as a fertilizer/soil improver can also result in soil pollution due to contaminants in the digestate.	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under "sector criteria" above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.
(3) Water	Not applicable
(4) Circular economy	Not applicable
(5) Pollution	Emissions to air and water are within the ranges set for anaerobic treatment of waste. Emissions to air (e.g. SO_x, NO_x and particulates) after combustion of biogas are controlled and, when needed, abated.
(6) Ecosystems	Not applicable

Table 39 — Composting of biowaste

Sector classification and activity	
Macro-sector	Water supply, sewerage, waste management and remediation
Description	Treatment of separately collected biowaste through composting (aerobic digestion) with the resulting production of compost for use as a fertilizer/soil improver.
Sector criteria	
Potential environmental benefits	Net GHG emission reduction, through avoidance of net GHG emissions compared to alternative options for biowaste management and from the production of compost that can be used as fertilizer/soil improver displacing synthetic fertilizers and eventually peat (e.g. in horticulture).
Environmental performance indicators	Environmental performance indicators can include: — amount of source-segregated waste collected separately; — mass or volume of digestate as fertilizer/soil improver, including for composting.
Rationale	
Composting of biowaste is eligible provided that (cumulative): — the biowaste is collected separately; — anaerobic digestion is not a technically viable alternative; — the compost produced is used as a fertilizer/soil improver. Composting describes the process by which microorganisms decompose biodegradable waste in the presence of oxygen, which is why it is sometimes also referred to as "aerobic digestion". As part of an integrated waste management system, composting is a valid route to divert biodegradable waste from landfilling and thus reduce the uncontrolled emissions of landfill gas, in particular methane. Composting makes organic matter more resilient to further degradation. The end product is compost which can be used as a natural fertilizer or soil improver in agriculture, horticulture and hobby gardening (provided it is of sufficient quality). The use of compost instead of synthetic fertilizers (e.g. derived from by-products of the petroleum industry) saves energy and reduces the consumption of fossil fuels. Other climate mitigation effects of compost use include the long-term carbon sequestration from combined vegetation (above and below ground; in living and dead biomass) and soil carbon which is about four times the stock found in vegetation capture in soils.	

Table 39 *(continued)*

Overall, anaerobic digestion (AD) exhibits the better environmental performance for the treatment of municipal biowaste (above all when digestate gets post-composted), where both the biogas and the digestate can be utilized. Thus, where technically and financially viable AD should be given preference to composting. At commercial scale, this could be presumed where appropriate feedstock (putrescible wastes with high humidity) is secured in stable quantities > 20,000 tpa (as a rule of thumb). However, depending on, for example, the properties of the waste, the amount of waste to treat, and the distance of transport, composting can be a technically viable alternative to AD. Biowaste with high ligneous content (such as in green garden waste) is typically not directly degradable by AD and therefore better suited for composting (unless the garden waste fraction is insignificant and economically infeasible to collect separately). However, when composting is selected, it is essential to consider whether the demand for fertilizer utilization, which is, for example, from agriculture in the surrounding area, is sufficient throughout the year.	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
The operation of a composting plant can lead to emissions of pollutants that have significant impacts on human respiratory systems and on ecosystems through acidification or eutrophication. The use of the resulting compost as fertilizer/soil improver can also result in soil pollution due to contaminants in the compost.	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under "sector criteria" above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.
(3) Water	Not applicable
(4) Circular economy	Not applicable
(5) Pollution	The site has a system in place that prevents leachate reaching groundwater. The resulting compost meets best practices for fertilizers/soil improvers for agricultural use.
(6) Ecosystems	Not applicable

Table 40 — Material recovery from waste

Sector classification and activity	
Macro-sector	Water supply, sewerage, waste management and remediation
Description	Sorting and processing of separately collected waste streams into secondary raw materials, usually involving a mechanical transformation process.
Sector criteria	
Potential environmental benefits	Net GHG emission reductions enabled through sorting and processing of separately collected waste streams for subsequent substitution of virgin materials, thus avoiding higher emissions from the alternative use of virgin materials (energy consumption for extraction, transport and production).
Environmental performance indicators	The environmental performance indicators are: — market value of secondary raw materials produced by recovered waste; — quality criteria for secondary raw materials.
Rationale	
Material recovery from separately collected waste is eligible provided that it produces secondary raw materials suitable for substitution of virgin materials in production processes and considering the materials' market value. The climate mitigation net benefits of material recovery are proven by pertinent studies.	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
Potential harm linked to the recovery of sorted materials is related to: — emissions to air, soil and water from the process; — generation of waste for final disposal.	

Table 40 *(continued)*

(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under "sector criteria" above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.
(3) Water	Not applicable
(4) Circular economy	The major share of the processed and separately collected waste is converted into secondary raw materials.
(5) Pollution	Ensure the secondary raw materials obtained do not contain substances of very high concern.
(6) Ecosystems	Not applicable

Table 41 — Landfill gas capture and energetic utilization

Sector classification and activity	
Macro-sector	Water supply, sewerage, waste management and remediation
Description	New installation and subsequent operation of a landfill gas capture and utilization system (or extension and/or retrofitting of an existing system) in operating or permanently closed landfills.
Sector criteria	
Potential environmental benefits	Net GHG emission reductions through the capture and utilization (for electricity/heat generation or biofuel production) of landfill gas.
Environmental performance indicators	The environmental performance indicators are: — the amount of captured landfill gas used for electricity/heat generation or biofuel production; — the amount of leakage from the landfill capture system.
Rationale	
Collection and utilization of landfill gas is eligible provided that: — the captured landfill gas is utilized for electricity/heat generation or biofuel production; — leakage from landfill gas capture is controlled by a monitoring system. The activity may be carried out as part of or complementary to the closure and remediation of old landfills. The landfill gas collection and its utilization contribute to climate change mitigation by: a) reducing methane emissions emanating from biodegradable waste previously deposited in the landfill body; b) displacing the use of fossil fuels for electricity/heat generation or fuel production. Landfill gas leakage can offset the climate mitigation benefits and therefore needs to be avoided. A monitoring system allows the detection of leakage. It is in the interest of the operator to fix detected leakage in order to minimize economic losses.	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
Potential harm linked to this activity is related to the emissions resulting from the utilization of landfill gas, such as sulfur dioxide, nitrous oxide and particulates.	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under "sector criteria" above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.
(3) Water	Not applicable
(4) Circular economy	Not applicable

Table 41 *(continued)*

(5) Pollution	Emissions to air (e.g. SO_x, NO_x and particulates) after combustion of biogas are controlled and, when needed, abated. Filters to capture particulate matter are installed to avoid particulates being dispersed into the atmosphere after combustion.
(6) Ecosystems	Not applicable

Table 42 — Direct air capture of CO_2

Sector classification and activity	
Macro-sector	Water supply, sewerage, waste management and remediation
Description	Direct air capture of CO_2
Sector criteria	
Potential environmental benefits	Provides substantial contribution to achieving low-carbon net GHG emissions targets by 2050. Reduces net GHG emissions from economic activities and GHG concentrations in the atmosphere. Leads to significant emission reductions compared to business as usual. Ensures there is sufficient storage and sequestration capacity available to meet the rate of capture of CO_2.
Environmental performance indicators	The environmental performance indicators are: — the amount of CO_2 removed from the atmosphere.
Rationale	
Direct air capture removes CO_2 from the atmosphere and lowers atmospheric CO_2 concentrations. NOTE ISO 27919-2 and ISO/TR 27921 provide additional information and requirements concerning direct air capture. All investments in direct capture of CO_2 from the atmosphere to lower global atmospheric CO_2 concentration levels are eligible.	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under “sector criteria” above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.
(3) Water	In water-stressed areas, use recycled water in the direct capture of CO_2.
(4) Circular economy	Ensure appropriate measures are in place to minimize and manage waste, energy and material use in construction, maintenance and decommissioning phases.
(5) Pollution	During construction and operations ensure that appropriate measures are in place to minimize risks to nearby water systems.
(6) Ecosystems	For direct air capture of CO_2 infrastructure in a protected area but likely to have a significant negative impact on its biodiversity, ensure that an appropriate assessment based on the conservation objectives of the protected area has been conducted in conformity with one of the following: — IFC Performance Standard 6, *Biodiversity Conservation and Sustainable Management of Living Natural Resources*; — an equivalent national standard. For such operations, a site-level biodiversity management plan shall be implemented.

Table 43 — Capture of anthropogenic emissions

Sector classification and activity	
Macro-sector	Water supply, sewerage, waste management and remediation
Description	Capture of anthropogenic CO_2 emissions
Sector criteria	
Potential environmental benefits	Provides substantial contribution to achieving low-carbon net GHG emissions targets by 2050. Reduces net GHG emissions from economic activities and GHG concentrations in the atmosphere. Leads to significant emission reductions compared to business as usual. Ensures there is sufficient storage and sequestration capacity available to meet the rate of capture of CO_2e.
Environmental performance indicators	The environmental performance indicators are: — the amount of CO_2 captured and removed.
Rationale	
Capture of anthropogenic emissions is eligible if it shows that the captured CO_2 will be transferred to a taxonomy-eligible CO_2 transportation operation and permanent sequestration facility or enables negative emissions (e.g. GHG removals). NOTE ISO 27919-2 and ISO/TR 27921 provide additional information and requirements concerning direct air capture.	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
The main environmental impacts associated with capture of anthropogenic emissions are due to chemicals/technologies used to capture carbon.	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under “sector criteria” above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.
(3) Water	Minimize additional water withdrawal requirements for the capture plant in order to avoid reductions in the river water flow. Avoid water contamination by discharges from earthworks and accidental spillage, wastewater discharges, etc. Protect groundwater hydrology and aquatic ecology through the construction and physical presence of the capture plant, and in the event of leaks and spills.
(4) Circular economy	Ensure appropriate measures are in place to minimize and manage waste and material use in construction and decommissioning phases. Select solvents based on environmental impact criteria and conducting full chemical risk assessments. Avoid hazardous waste from the amine solvent.
(5) Pollution	A minimum requirement is the implementation and adherence to a recognized environmental management system (e.g. ISO 14001 or equivalent): — select solvents based on environmental impact criteria and conduct full chemical risk assessments; — prevent release during operation by implementing permanent leakage detection systems; — avoid loss of ammonia. Minimize the formation of secondary aerosol and the production of tropospheric ozone. Fans, compressors, pumps and other equipment used for CCS and CO_2 transport should adhere to eco-design principles and be as efficient as possible to reduce emissions associated with electricity generation.

Table 43 *(continued)*

(6) Ecosystems	For operations located in a protected area, or which include activities outside a protected area but likely to have a significant negative impact on its biodiversity, ensure that an appropriate assessment based on the conservation objectives of the protected area has been conducted in conformity with one of the following: — IFC Performance Standard 6, *Biodiversity Conservation and Sustainable Management of Living Natural Resources*; — an equivalent national standard. For such operations, a site-level biodiversity management plan shall be implemented.

Table 44 — Transport of captured CO_2

Sector classification and activity	
Macro-sector	Water supply, sewerage, waste management and remediation activities
Description	Transport of captured CO_2
Sector criteria	
Potential environmental benefits	Provides substantial contribution to achieving low-carbon net GHG emissions target by 2050. Reduces net GHG emissions from economic activities and GHG concentrations in the atmosphere. Leads to significant emission reductions compared to business as usual. Ensures there is sufficient storage and sequestration capacity available to meet the rate of capture of CO_2e.
Environmental performance indicators	The environmental performance indicators are: — amount of captured CO_2 transported; — % leakage/tonne of CO_2 transported from the head of the pipeline to the injection point; — amount of CO_2 delivered to a taxonomy-eligible permanent sequestration site (see Table 45).
Rationale	
Only pipelines which lead directly to an eligible permanent sequestration site are eligible. NOTE ISO 27919-2 and ISO/TR 27921 provide additional information and requirements concerning CO_2 management.	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
The main environmental aspects associated with transport of CO_2 are due to the following: — Construction stage of the transport network: all aspects shall be considered that are usually connected with construction, such as terrestrial habitat alteration, loss of valuable ecosystems, land consumption, overburdened disposal systems, negative impacts on biodiversity, emissions of particulate matter and NO_x, noise, and hazardous materials. An EIA should be done in accordance with best practices. — Use stage: Leakage should be kept to a minimum. Underground networks can have an impact on ground water systems and on local ecosystems.	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under “sector criteria” above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.

Table 44 *(continued)*

(3) Water	Avoid water contamination due to discharges from pipeline testing, earthworks and accidental spillage, wastewater discharges, etc. Activity should minimize risks related to local water quality or local water consumption during construction, operation and decommissioning phases of the activity. A minimum requirement is the implementation and adherence to a recognized environmental management system (e.g. ISO 14001 or equivalent). For construction site activities, see the principles of the IFC EHS Guidelines[24], or similar best practices.
(4) Circular economy	Ensure appropriate measures are in place to minimize and manage waste and material use in construction and decommissioning phases.
(5) Pollution	A minimum requirement is the implementation and adherence to a recognized environmental management system (e.g. ISO 14001 or equivalent). Prevent releases during operation by implementing permanent leak detection systems. Fans, compressors, pumps and equipment used for CCS and CO_2 transport should adhere to eco-design principles and be as efficient as possible to reduce emissions in the generation of the required electricity.
(6) Ecosystems	For operations located in a protected area, or which include activities outside a protected area but likely to have a significant negative impact on its biodiversity, ensure that an appropriate assessment based on the conservation objectives of the protected area has been conducted in conformity with one of the following: — IFC Performance Standard 6, *Biodiversity Conservation and Sustainable Management of Living Natural Resources*; — an equivalent national standard. For such operations, a site-level biodiversity management plan shall be implemented. The routing should be as short as possible and not pass through vulnerable local ecosystems.

Table 45 — Permanent sequestration of captured CO_2

Sector classification and activity	
Macro-sector	Water supply; sewerage; waste management and remediation activities
Description	Permanent sequestration of captured CO_2
Sector criteria	
Potential environmental benefits	Provides substantial contribution to achieving low-carbon net GHG emissions targets by 2050. Reduces net GHG emissions from economic activities and GHG concentrations in the atmosphere. Leads to significant emission reductions compared to business as usual. Ensures there is sufficient storage and sequestration capacity available to meet the rate of capture of CO_2e.
Environmental performance indicators	Environmental performance indicators can include: — amount of leakage from reservoir.
Rationale	
Operation of a permanent CO_2 storage facility reduces CO_2 emissions to the atmosphere. NOTE ISO 27919-2, ISO/TR 27921 and ISO 27914 provide additional information and requirements concerning CO_2 management.	

Table 45 *(continued)*

DNSH assessment (to evaluate impacts that are not the core environmental objective)	
The main environmental impacts associated with sequestration of CO_2 are due to: — the risk of leakage; — the long-term impermeability of the reservoirs; Central issues regarding the monitoring and the interrelation of carbon with physical, chemical and geological conditions in the reservoir are still debated. However, the safety of CO_2 storage can be ensured with the implementation of specific rules and requirements.	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under "sector criteria" above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.
(3) Water	— Avoid water contamination by discharges from pipeline testing, earthworks and accidental spillage, wastewater discharges, etc. — Protect groundwater hydrology and aquatic ecology through the construction and physical presence of the storage plant, and in the event of leaks and spills. — Prove impermeability of the storage site during operation or post closure in order to keep the groundwater safe from acidification, which can also lead to leaching of trace metals from the surrounding matrix. — Do not pollute groundwater on contact while injecting CO_2 into the storage formation that leads to the displacement of brines. — Prove impossibility of water acidification. — Monitor storage sites throughout operation and post closure.
(4) Circular economy	Ensure appropriate measures are in place to minimize and manage waste and material use in construction and decommissioning phases.
(5) Pollution	Ensure the establishment of appropriate controls through: — implementation and adherence to a recognized environmental management system (e.g. ISO 14001 or equivalent); — implementation of leak detection systems.
(6) Ecosystems	For operations located in a protected area, or which include activities outside a protected area but likely to have a significant negative impact on its biodiversity, ensure that an appropriate assessment based on the conservation objectives of the protected area has been conducted in conformity with one of the following: — IFC Performance Standard 6, *Biodiversity Conservation and Sustainable Management of Living Natural Resources*; — an equivalent national standard. For such operations, a site-level biodiversity management plan shall be implemented.

5.4.5 Transport and storage

5.4.5.1 Inclusion of transport and storage

Transport and storage are included in the taxonomy because the bulk of this sector's energy comes from oil. This means that transport is responsible for a large share of the world's GHG emissions and is a major contributor to climate change.

Rail and inland waterways are also important emissions sources covered by the taxonomy. Compared to road and air, they can provide modal shift benefits.

While public transport and the infrastructure for low-carbon transport in themselves are smaller sources of net GHG emissions, they are vital to achieve systemic change towards more sustainable mobility and are therefore also included in the taxonomy.

Emissions quantification is based on LCA (well-to-wheel) calculation (e.g. see ISO 14040 and ISO 14044) of the vehicle.

The operation of vehicle fleets where fossil fuels are substituted with low-carbon fuels such as sustainable biofuels and synthetic fuels can make a substantial contribution to CO_2 net emissions savings in the transport sector, especially when electrification does not offer viable options. They enable the decarbonization of aviation, marine transportation and heavy freighting while using the current infrastructure and are therefore also eligible.

In the transition period, natural gas is a very important energy source that contributes to a significant reduction of GHG emissions.

5.4.5.2 Transport and storage areas

The taxonomy for transport and storage is given in Tables 46 to 59.

Table 46 — Passenger rail transport (inter-urban)

Sector classification and activity	
Macro-sector	Transport and storage
Description	Passenger rail transport (inter-urban)
Sector criteria	
Potential environmental benefits	Demonstrate substantial GHG emission reductions.
Environmental performance indicators	Environmental performance indicators can include: — CO_2e emissions per passenger kilometre (gCO_2e/pkm).
Rationale	
Significant reductions of CO_2 emissions per passenger kilometre can be achieved by investing in passenger rail service in order to encourage greater use of the rail transport network. 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 energy carriers used by zero direct emissions transport is assumed to become low- or zero-carbon in the near future.	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
The main potential significant harm to other environmental objectives from the operation of rail transport activities are attributed to air pollution, noise and vibration pollution, and some potential for water contamination. Direct emissions of air pollutants are not an issue of concern in the case of electrified rail, but only the utilization of very efficient diesel or hybrid engines would meet the CO_2e eligibility criteria that target substantial mitigation of net GHG emissions.	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under “sector criteria” above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.
(3) Water	Ensure that drainage from the tracks is not released into water bodies, for example, by constructing basins for drainage water that lead to a water treatment plant before being released into water bodies.
(4) Circular economy	Ensure end-of-life management for the rolling stock, e.g. reuse and recycle of parts such as batteries.

Table 46 *(continued)*

(5) Pollution	Engines for the propulsion of railway locomotives (RLL) and engines for the propulsion of railcars (RLR) shall conform to the latest applicable standards.
(6) Ecosystems	Not applicable

Table 47 — Freight rail transport

Sector classification and activity	
Macro-sector	Transport and storage
Description	Freight rail transport
Sector criteria	
Potential environmental benefits	Demonstrate substantial GHG emission reductions.
Environmental performance indicators	Environmental performance indicators can include: — CO_2e emissions per tonne-kilometre (gCO_2e/tkm). Indicators are determined in line with the units applied in respective countries/regions (e.g. CO_2 g/km in EU, l/100 km in China, km/l in Japan).
Rationale	
The carbon intensity of freight rail, including diesel, is in most cases significantly lower than road freight transport. Average direct emissions for diesel rail are in the range of 18 gCO_2e/tkm to 40 gCO_2e/tkm compared with 80 gCO_2e/tkm to 100 gCO_2e/tkm for road freight. Emissions intensity can vary significantly depending on the type of cargo transported.	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
The main potential significant harm to other environmental objectives from the operation of rail transport activities are attributed to air pollution, noise and vibration pollution, and some potential for water contamination. Direct emissions of air pollutants are not an issue of concern in the case of electrified rail, but only utilization of very efficient diesel or hybrid engines would meet the CO_2e eligibility criteria that target substantial mitigation of net GHG emissions.	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under “sector criteria” above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.
(3) Water	Ensure that drainage from the tracks is not released into water bodies, for example, by constructing basins for drainage water that lead to a water treatment plant before being released into water bodies.
(4) Circular economy	Ensure end-of-life management for the rolling stock, e.g. reuse and recycle of parts such as batteries.
(5) Pollution	Engines for the propulsion of railway locomotives (RLL) and engines for the propulsion of railcars (RLR) shall conform to the latest applicable standards.
(6) Ecosystems	Not applicable

Table 48 — Urban and suburban passenger land transport (public transport)

Sector classification and activity	
Macro-sector	Transport and storage
Description	Urban and suburban passenger land transport (public transport)
Sector criteria	
Potential environmental benefits	Demonstrate substantial GHG emission reductions.

Table 48 *(continued)*

Environmental performance indicators	Environmental performance indicators can include: — CO_2e emissions per passenger kilometre (gCO_2e/pkm). Indicators are determined in line with the units applied in respective countries/regions (e.g. CO_2 g/km in EU, l/100 km in China, km/l in Japan).
Rationale	
Diesel and petrol cars still represent the immense majority of the road fleet in all countries and the penetration of electric vehicles will materialize at a yet unknown pace. In the meantime, a lack of investment in public transport fleet renewal can lead to behavioural changes, such as modal shifts to private cars, that would be significantly more difficult to reverse in the future.	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
The main potential significant harm to other environmental objectives from the operation of urban and suburban passenger land transport (public transport) are summarized as follows: — Direct emissions to air from the exhaust gases of internal combustion engine: nitrogen oxides (NO_x), total hydrocarbon (THC), non-methane hydrocarbons (NMHC), carbon monoxide (CO), particulate matter (PM) and particle number, and from tyre abrasion and brakes friction and noise emissions. — Waste generation (hazardous and non-hazardous) during maintenance and end of life of the vehicle or rolling stock.	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under “sector criteria” above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.
(3) Water	Not applicable
(4) Circular economy	Not applicable
(5) Pollution	Railcars, locomotives shall conform to the latest applicable standards.
(6) Ecosystems	Not applicable

Table 49 — Infrastructure for low-carbon land transport

Sector classification and activity	
Macro-sector	Construction
Description	Infrastructure for low-carbon land transport including the construction of: — roads and motorways; — railways and underground railways; — bridges and tunnels.
Sector criteria	
Potential environmental benefits	Demonstrate substantial GHG emission reductions.
Environmental performance indicators	Environmental performance indicators can include: — CO_2e emissions per passenger-kilometre (gCO_2e/pkm,) per tonne-kilometre, (gCO_2e/tkm) or per kilometre (gCO_2e/km). Indicators are determined in line with the units applied in respective countries/regions (e.g. CO_2 g/km in EU, l/100 km in China, km/l in Japan).

Table 49 *(continued)*

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. One option is to accommodate all electric rail lines and non-electrified lines by operating battery powered and hydrogen trains. However, even if non-electrified, there can be a case for renewal of rail infrastructure in order to ensure continuity of service while alternative powered trains (hydrogen, battery) are deployed in future years, hence the inclusion of non-electrified rail infrastructure with an existing plan for electrification or use of alternatively powered trains. There is no significant risk of lock-in in those cases where the fleet is due for renewal. 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, hydrogen fuelling stations or connecting electric trucks to overhead power lines on so-called “electric highways”); — infrastructure and equipment for active mobility (walking and cycling); — non-electrified rail infrastructure with an existing plan for electrification or use of alternatively powered trains.	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
The main potential significant harm to other environmental objectives from infrastructure activities are attributed to noise and vibration pollution, water contamination, waste generation and impacts on biodiversity (habitat and wildlife) and land use, specifically the following: — Contamination of water during construction and unsustainable use of water during construction and operations. — Unsustainable use of resources during constructions, e.g. generation of high amount of waste, no recycling/reuse of construction waste. — Noise pollution can be relevant for both rolling stock and railway infrastructure, as noise can be generated by both rolling stock and poor conditions of rail tracks. — Construction of infrastructure can cause significant harm when taking place in protected areas or areas of high biodiversity values outside protected areas. — Infrastructure can cause fragmentation and degradation of the natural and urban landscape due to the “barrier” effects of the infrastructure and can involve risks of wildlife accidents caused by collisions. Railway infrastructure (in particular tunnels) can change and degrade hydro-morphological conditions of water bodies and therefore have impacts on aquatic ecosystems.	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under “sector criteria” above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.
(3) Water	Ensure that no harmful substances contaminate water during operation, renewal, upgrade and new construction of infrastructure.
(4) Circular economy	Reuse parts and use recycled material during the renewal, upgrade and construction of infrastructure. At least 80 % (by mass) of the non-hazardous construction and demolition waste (excluding naturally occurring material) generated on the construction site shall be prepared for reuse, recycling and other material recovery, including backfilling operations using waste to substitute other materials. This can be achieved by executing construction works in line with best practices.
(5) Pollution	Minimize noise and vibrations from use of infrastructure by introducing open trenches/ wall barriers/other measures. Minimize noise, dust, emissions pollution during construction/maintenance works.

Table 49 *(continued)*

(6) Ecosystems	Projects likely to affect designated protected areas, or areas of high nature and biodiversity value and vulnerability including UNESCO World Heritage and KBAs may be implemented only if the EIA and the appropriate assessment have concluded that the infrastructure will not adversely affect the integrity of the site, and all necessary mitigation measures are in place to reduce the impacts on species and habitats. Possible mitigation measures are: a) reduce fragmentation and ensure the connectivity of habitats (e.g. tunnels and viaducts, under- or above-ground wildlife crossings); b) minimize collision risks through barriers/fences for wildlife; c) avoid works during critical periods of species such as mating, reproductive, breeding or migration periods.

Table 50 — Passenger cars, light commercial vehicles and 2- and 3-wheel vehicles and quadricycles

Sector classification and activity	
Macro-sector	Transport and storage
Description	Passenger cars, light commercial vehicles and 2- and 3-wheel vehicles and quadricycles.
Sector criteria	
Potential environmental benefits	Demonstrate substantial GHG emission reductions.
Environmental performance indicators	Environmental performance indicators can include: — gCO_2/km according to a carbon footprint study based on ISO 14067; — fuel efficiency according to units applied in respective countries/regions (e.g. l/100km in China, km/l in Japan).
Rationale	
Thresholds are based upon standard levels (e.g. CO_2, energy consumption) taking into account measures, technologies and testing methodologies in respective countries/regions (e.g. WLTP, NEDC, CATC). Zero direct emission vehicles and vehicles with low and reducing emission intensities contribute substantially to climate mitigation phasing out anthropogenic emissions of GHGs, including from fossil fuels. Zero direct emissions vehicles (e.g. electric, hydrogen) are eligible because the generation of the energy carriers used by zero direct emissions transport is assumed to become low or zero-carbon in the near future. This activity includes operation of vehicles and vehicles classified as 2- and 3-wheel vehicles and quadricycles. Vehicle emissions shall be calculated on a life cycle basis. NOTE The treatment of electricity supply in LCA is specified in ISO 14067.	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
Additional environmental aspects to be considered for investments on passenger cars and light commercial vehicles include indirect emissions to air from the production of fuels and energy carriers (however, this is out of the control of vehicle manufacturers and operators). The manufacture of vehicles, particularly batteries, is part of the scope of the sub-group “manufacture of low-carbon transport vehicles, equipment and infrastructure”.	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under “sector criteria” above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.
(3) Water	Not applicable
(4) Circular economy	Consider the possibility to reuse, remanufacture or recycle at end of life all or parts of vehicles.

Table 50 *(continued)*

(5) Pollution	Direct emissions to air from the exhaust gases of internal combustion engine: nitrogen oxides (NO_x), total hydrocarbon (THC), non-methane hydrocarbons (NMHC), carbon monoxide (CO), particulate matter (PM) and particle number, and from tyre abrasion and brakes friction and noise emissions. Waste generation (hazardous and non-hazardous) during maintenance and end of life of the vehicle.
(6) Ecosystems	Not applicable

Table 51 — Freight transport services by road

Sector classification and activity	
Macro-sector	Transport and storage
Description	Freight transport services by road
Sector criteria	
Potential environmental benefits	Demonstrate substantial GHG emission reductions.
Environmental performance indicators	Environmental performance indicators can include: — CO_2 emissions per vehicle kilometre (gCO_2/km) or gCO_2/kWh.
Rationale	
Thresholds are based upon standard levels (e.g. CO_2, energy consumption) taking into account measures, technologies and testing methodologies in respective countries/regions (e.g. WLTP, NEDC, CATC). Low-emission vehicles and vehicles with low and reducing emission intensities contribute substantially to climate mitigation phasing out anthropogenic emissions of GHGs, including from fossil fuels. Zero direct emissions vehicles (e.g. electric, hydrogen) are eligible because the generation of the energy carriers used by zero direct emissions transport is assumed to become low or zero-carbon in the near future. Dedicated vehicles solely using advanced biofuels or renewable liquid and gaseous transport fuels of non-biological origin are eligible. It is important to assess the full life cycle emissions from heavy-duty vehicles. By contrast to light-duty vehicles, the electrification of trucks is currently limited to small demonstration fleets. Especially for heavy trucks for regional and long-haul operations, fuel substitution to advanced biofuels and renewable synthetic fuels are considered a relevant mitigation option in the medium term. Towards the realization of the goals of the Paris Agreement, green finance should lead to the mobilization of funds not only for specific technologies but also for any low-emission technologies considered "technology-neutral" and any opportunities contributing to climate change mitigation. Accordingly, environmental performance indicators and related thresholds should be determined in line with national criteria developed in the respective countries/regions.	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under "sector criteria" above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.
(3) Water	Not applicable
(4) Circular economy	Consider the possibility to reuse, remanufacture or recycle at end of life all or parts of vehicles.
(5) Pollution	Direct emissions to air from the exhaust gases of internal combustion engine: nitrogen oxides (NO_x), total hydrocarbon (THC), non-methane hydrocarbons (NMHC), carbon monoxide (CO), particulate matter (PM) and particle number, and from tyre abrasion and brakes friction and noise emissions. Waste generation (hazardous and non-hazardous) during maintenance and end of life of the vehicle.

Table 51 *(continued)*

(6) Ecosystems	Not applicable

Table 52 — Inter-urban scheduled road transport

Sector classification and activity	
Macro-sector	Transport and storage
Description	Inter-urban scheduled road transport services of passengers
Sector criteria	
Potential environmental benefits	Demonstrate substantial GHG emission reductions.
Environmental performance indicators	Environmental performance indicators can include: — CO_2e emissions per passenger kilometre (gCO_2e/pkm).
Rationale	
With no commercial availability of zero tailpipe emission vehicles for this activity, fuel substitution to advanced biofuels and renewable synthetic fuels are considered a relevant mitigation option for some transport modes in the medium term. Dedicated vehicles solely using advanced biofuels or renewable liquid and gaseous transport fuels of non-biological origin are eligible.	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under “sector criteria” above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.
(3) Water	Not applicable
(4) Circular economy	Consider the possibility to reuse, remanufacture or recycle at end of life all or parts of vehicles.
(5) Pollution	Direct emissions to air from the exhaust gases of internal combustion engine: nitrogen oxides (NO_x), total hydrocarbon (THC), non-methane hydrocarbons (NMHC), carbon monoxide (CO), particulate matter (PM) and particle number, and from tyre abrasion and brakes friction and noise emissions. Waste generation (hazardous and non-hazardous) during maintenance and end of life of the vehicle.
(6) Ecosystems	Not applicable

Table 53 — Inland passenger water transport

Sector classification and activity	
Macro-sector	Transport and storage
Description	Inland passenger water transport
Sector criteria	
Potential environmental benefits	Demonstrate substantial GHG emission reductions.
Environmental performance indicators	Environmental performance indicators can include: — CO_2e emissions per passenger kilometre (gCO_2e/pkm).

Table 53 *(continued)*

Rationale	
Inland water transport can substitute for higher GHG emitting modes of transportation. With limited availability of zero direct emission fleets for this activity, fuel substitution to advanced biofuels and renewable synthetic fuels are considered a relevant mitigation option for some transport modes. Therefore, dedicated vehicles solely using advanced biofuels or renewable liquid and gaseous transport fuels of non-biological origin are eligible.	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under “sector criteria” above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.
(3) Water	Direct and indirect emission of pollutants in water. For any activity that leads to direct or indirect pollutant releases into water bodies, ensure that the activity is implemented in accordance with environmental best practices.
(4) Circular economy	Not applicable
(5) Pollution	Potential pollution from oil fuel leakage or damage to tanks due to accidents. Pollution to the marine environment from urban litter (e.g. plastic bottles and bags).
(6) Ecosystems	Fixed or mobile vessel anchorages can pollute or destroy marine habitats for species. Urban wastes can have adverse effects on biodiversity and living species.

Table 54 — Inland freight water transport

Sector classification and activity	
Macro-sector	Transport and storage
Description	Inland freight water transport
Sector criteria	
Potential environmental benefits	Demonstrate substantial GHG emission reductions.
Environmental performance indicators	Environmental performance indicators can include: — CO_2e emissions per tonne kilometre (gCO_2e/tkm).
Rationale	
Inland water transport can substitute for higher GHG emitting modes of transportation. With limited availability of zero direct emission fleets for this activity, fuel substitution to advanced biofuels and renewable synthetic fuels are considered a relevant mitigation option for some transport modes. Therefore, dedicated vessels solely using advanced biofuels or renewable liquid and gaseous transport fuels of non-biological origin are eligible.	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under “sector criteria” above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.
(3) Water	Direct and indirect pollutant discharges to water bodies. For any activity that leads to direct or indirect pollutant releases into water bodies, ensure that the activity is implemented in accordance with environmental best practices.
(4) Circular economy	Not applicable
(5) Pollution	Potential pollution from oil fuel leakage or damage to tanks due to accidents. Pollution to the marine environment from urban litter (e.g. plastic bottles and bags).

Table 54 *(continued)*

(6) Ecosystems	Fixed or mobile vessel anchorages can pollute or destroy marine habitats for species. Urban wastes can have adverse effects on biodiversity and living species.

Table 55 — Construction of water projects

Sector classification and activity	
Macro-sector	Transport and storage
Description	Infrastructure for low-carbon transport of water including the construction of water projects
Sector criteria	
Potential environmental benefits	Demonstrate substantial GHG emission reductions.
Environmental performance indicators	Environmental performance indicators can include: — CO_2e emissions per passenger-kilometre (gCO_2e/pkm) or per tonne-kilometre (gCO_2e/tkm).
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 activities considered eligible under the rest of the water transport section of the taxonomy. Supply chain activity for renewable energy includes, for example, port facilities dedicated to supporting the offshore wind power sector. The construction and operation of transport infrastructure is eligible where infrastructure is: — required for zero direct emissions water transport (e.g. batteries or hydrogen fuelling facilities); — dedicated to supporting the renewable energy sector; Only infrastructure that is fundamental to the operation of the transport service is eligible.	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
The main potential significant harm to other environmental objectives from water infrastructure activities are attributed to the alteration of hydro morphology due to dredging, maintenance activities and construction of new infrastructures and waterways, as well as impact on biodiversity and ecosystems from such activities.	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under “sector criteria” above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.
(3) Water	Minimize impacts to water quality during construction and maintenance.
(4) Circular economy	Reuse parts and use recycled material during the renewal, upgrade and construction of water projects. At least 80 % (by mass) of the non-hazardous construction and demolition waste generated on the construction site shall be prepared for reuse, recycling and other material recovery, including backfilling operations using waste to substitute other materials.
(5) Pollution	Minimize noise, vibration, dust and pollutant emissions during construction and maintenance.
(6) Ecosystems	For operations located in a protected area, or which include activities outside a protected area but likely to have a significant negative impact on its biodiversity, ensure that an appropriate assessment based on the conservation objectives of the protected area has been conducted in conformity with one of the following: — IFC Performance Standard 6, *Biodiversity Conservation and Sustainable Management of Living Natural Resources*; — an equivalent national standard. For such operations, a site-level biodiversity management plan shall be implemented.

Table 56 — Urban development

Sector classification and activity	
Macro-sector	Urban development
Description	Infrastructure for low-carbon community
Sector criteria	
Potential environmental benefits	Demonstrate substantial GHG emission reductions. Demonstrate a substantial avoidance of CO_2 emissions from urban planning based on public transport, mixed area uses areas (activities, housing), green infrastructure, shading generation and urban heat island mitigation.
Environmental performance indicators	Environmental performance indicators can include: — CO_2e emissions per inhabitants per square kilometre (gCO_2e/hkm^2).
Rationale	
The construction and operation of infrastructure for low-carbon urban communities are eligible because these are considered a key enabling factors for improving the uptake of activities considered eligible under the taxonomy. The construction and operation of infrastructure is eligible in situations where it is: — required for zero direct emissions (e.g. batteries or hydrogen fuelling facilities); — dedicated to supporting the renewable energy sector; Only infrastructure that is fundamental to the operation of the urban sustainable services is eligible and urban passive design strategies should be applied.	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under “sector criteria” above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation. Reduce heat-island effect in urban impermeable areas through the use of light-coloured surfaces or UV-absorbing material.
(3) Water	For construction, operational and decommissioning activities near water (i.e. water-course, wetland, river, sea, etc.), ensure that appropriate measures are in place to minimize risks to nearby water systems.
(4) Circular economy	Ensure appropriate measures are in place to minimize and manage waste through collection and segregation, and optimization of energy and material use in construction, maintenance and decommissioning phases.
(5) Pollution	Reduce air pollution and noise by limiting speed and use of fossil-fuelled vehicles in urban areas. Protect water and soil against leakage of pollutants.
(6) Ecosystems	For planning and constructing works in a protected area, or which includes activities outside a protected area but likely to have a significant negative impact on its biodiversity, ensure that an appropriate assessment based on the conservation objectives of the protected area has been conducted in conformity with one of the following: — IFC Performance Standard 6, *Biodiversity Conservation and Sustainable Management of Living Natural Resources*; — an equivalent national standard. For such operations, ensure that a site-level biodiversity management plan exists and is implemented.

Table 57 — Walking infrastructure

Sector classification and activity	
Macro-sector	Urban development
Description	Walking infrastructure
Sector criteria	
Potential environmental benefits	Support a soft and healthy individual transport. Demonstrate substantial GHG emission reductions.
Environmental performance indicators	Environmental performance indicators can include: — kilometres of walking infrastructure separated from road and other transport infrastructure (bicycles, motor vehicles); — CO_2e emissions per inhabitant/year for transport.
Rationale	
The construction and operation of infrastructure for low-carbon urban communities are eligible because these are considered a key enabling factor for improving the uptake of activities considered eligible under the rest of the taxonomy. The construction and operation of infrastructure is eligible in situations where it is: — dedicated solely for use by pedestrians; — accessible to all users, significantly privileging walking or cycling (e.g. shared space); — powered by renewable energy, e.g. for lights or signal equipment; — responsible for significantly reducing energy consumption.	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under “sector criteria” above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.
(3) Water	When constructing walking infrastructures near water (i.e. watercourse, wetland, river, sea, etc.), ensure that appropriate measures are in place to minimize risks to nearby water systems.
(4) Circular economy	Ensure appropriate measures are in place to minimize and manage waste, energy and material use in construction, maintenance and decommissioning phases.
(5) Pollution	Not applicable
(6) Ecosystems	For planning and constructing walking infrastructure in a protected area, or which includes activities outside a protected area but likely to have a significant negative impact on its biodiversity, ensure that an appropriate assessment based on the conservation objectives of the protected area has been conducted in conformity with one of the following: — IFC Performance Standard 6, *Biodiversity Conservation and Sustainable Management of Living Natural Resources*; — an equivalent national standard. For such operations, ensure that a site-level biodiversity management plan exists and is implemented.

Table 58 — Cycling infrastructure

Sector classification and activity	
Macro-sector	Urban development
Description	Cycling infrastructure
Sector criteria	
Potential environmental benefits	Demonstrate substantial GHG emission reductions.
Environmental performance indicators	Environmental performance indicators can include: — kilometres of cycling infrastructure separated from road and other transport infrastructure (pedestrians, motor vehicles); — CO_2e emissions per inhabitant/year for transport.
Rationale	
The construction and operation of infrastructure for low-carbon urban communities are eligible because these are considered key enabling factors for improving the uptake of activities considered eligible under the rest of the taxonomy. The construction and operation of infrastructure is eligible where it is: — required for bicycle sharing (e.g. bicycle parking and sharing facilities, charging points used by the shared bicycle fleet); — accessible to all users, significantly privileging cycling (e.g. shared space); — powered by renewable energy, e.g. for lights or signal equipment; — responsible for significantly reducing energy consumption.	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under “sector criteria” above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.
(3) Water	For constructing, operating and decommissioning cycling infrastructures near water (i.e. watercourse, wetland, river, sea, etc.), ensure that appropriate measures are in place to minimize risks to nearby water systems.
(4) Circular economy	Ensure appropriate measures are in place to minimize and manage waste, energy and material use in construction, maintenance and decommissioning phases.
(5) Pollution	Not applicable
(6) Ecosystems	For planning and constructing cycling infrastructure in a protected area, or which includes activities outside a protected area but likely to have a significant negative impact on its biodiversity, ensure that an appropriate assessment based on the conservation objectives of the protected area has been conducted in conformity with one of the following: — IFC Performance Standard 6, *Biodiversity Conservation and Sustainable Management of Living Natural Resources*; — an equivalent national standard. For such operations, ensure that a site-level biodiversity management plan exists and is implemented.

Table 59 — Personal mobility device sharing

Sector classification and activity	
Macro-sector	Urban development
Description	Personal mobility device sharing
Sector criteria	
Potential environmental benefits	Demonstrate substantial GHG emission reductions.
Environmental performance indicators	Environmental performance indicators can include: — number of personal mobility device sharing infrastructure per km^2 urban area; — CO_2e emissions per inhabitant/year for transport.
Rationale	
The construction and operation of infrastructure for low-carbon urban communities are eligible because these are considered key enabling factors for improving the uptake of activities considered eligible under the rest of the taxonomy. The construction and operation of infrastructure is eligible where it is: — required for zero direct emissions (e.g. battery charging facilities); — required for personal mobility device sharing (e.g. parking and sharing facilities, charging points used by the shared mobility devices); — powered by renewable energy, e.g. for lights or IT network; — responsible for significantly reducing energy consumption.	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under “sector criteria” above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation (see Annex A).
(3) Water	Not applicable
(4) Circular economy	Ensure appropriate measures are in place to minimize and manage waste, energy and material use in construction, maintenance and decommissioning phases.
(5) Pollution	Not applicable
(6) Ecosystems	For planning and constructing personal mobility device sharing infrastructure in a protected area, or which includes activities outside a protected area but likely to have a significant negative impact on its biodiversity, ensure that an appropriate assessment based on the conservation objectives of the protected area has been conducted in conformity with one of the following: — IFC Performance Standard 6, *Biodiversity Conservation and Sustainable Management of Living Natural Resources*; — an equivalent national standard. For such operations, ensure that a site-level biodiversity management plan exists and is implemented.

5.4.6 Information and communication technology (ICT)

The sector can have a significant impact on GHG mitigation in the following ways:

— mitigation potential associated with high-emitting ICT sectors ("greening of"): data centres, telecommunication networks and software;

— enabling potential of digitalized solutions ("greening by"): data-driven solutions for net GHG emission reductions and context-specific digitalized solutions for resource efficiency.

Considering ICT's dependence on electricity, the sector can reduce GHG emissions by improving energy efficiency.

The taxonomy for ICT is given in Tables 60 to 61.

Table 60 — Data processing, hosting and related activities

Sector classification and activity	
Macro-sector	ICT
Description	Storage, manipulation, management, movement, control, display, switching, interchange, transmission or reception of data through data centres. Data centres include the following: — ICT equipment and services; — cooling equipment; — power equipment; — buildings; — monitoring systems.
Sector criteria	
Potential environmental benefits	Data centres implementing a comprehensive set of energy efficiency practices can make a substantial contribution to climate change mitigation.
Environmental performance indicators	The potential metric for data centres is power usage efficiency (PUE): total facility power/IT equipment power. NOTE See ISO/IEC 30134-2.
Rationale	
Rationale for energy efficiency versus emission reduction as mitigation principle: low or zero emissions can be achieved by sourcing electricity from renewable sources, from the grid or on site. Given the mounting competition for renewable energy, an expected greening of the energy system, and the exponential projected growth of electricity consumption deriving from the digitalization of the economy, inclusion in the taxonomy will only depend on energy efficiency.	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under "sector criteria" above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.
(3) Water	Ensure appropriate measures are in place to minimize and manage water use in construction, maintenance and decommissioning phases.
(4) Circular economy	Ensure appropriate measures are in place to minimize and manage waste, energy and material use in construction, maintenance and decommissioning phases.
(5) Pollution	Limit impermeability of built areas. Limit use of refrigerated air conditioning and use insulation to reduce noise emissions.

Table 60 *(continued)*

(6) Ecosystems	For planning and constructing buildings in a protected area, or which includes activities outside a protected area but likely to have a significant negative impact on its biodiversity, ensure that an appropriate assessment based on the conservation objectives of the protected area has been conducted in conformity with one of the following: — IFC Performance Standard 6, *Biodiversity Conservation and Sustainable Management of Living Natural Resources*; — an equivalent national standard. For such operations, ensure that a site-level biodiversity management plan exists and is implemented.

Table 61 — Data driven solutions for net GHG emission reductions

Sector classification and activity	
Macro-sector	ICT
Description	Development or use of ICT solutions that are exclusively aimed at collecting, transmitting or storing data and at its modelling and use when these activities are aimed at the provision of data and analytics for decision-making (by the public and private sectors) enabling GHG emission reductions.
Sector criteria	
Potential environmental benefits	Data-driven solutions for GHG emission reductions are considered to make a substantial contribution to climate change mitigation because of the emission reductions they enable.
Rationale	
The mix of activity 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. An example is 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 to up to 94 %, from around 88 % across the industry.	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under “sector criteria” above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.
(3) Water	Ensure appropriate measures are in place to minimize and manage water use in construction, maintenance and decommissioning phases.
(4) Circular economy	Ensure appropriate measures are in place to minimize and manage waste, energy and material use in construction, maintenance and decommissioning phases.
(5) Pollution	Limit impermeability of built areas. Limit use of refrigerated air conditioning and use insulation to reduce noise emissions.
(6) Ecosystems	For planning and constructing buildings in a protected area, or which includes activities outside a protected area but likely to have a significant negative impact on its biodiversity, ensure that an appropriate assessment based on the conservation objectives of the protected area has been conducted in conformity with one of the following: — IFC Performance Standard 6, *Biodiversity Conservation and Sustainable Management of Living Natural Resources*; — an equivalent national standard. For such operations, ensure that a site-level biodiversity management plan exists and is implemented.

5.4.7 Construction

5.4.7.1 Economic activities

Economic activities include the following:

a) Construction of new buildings: This activity covers real estate development and enables project capital expenditures of construction clients and the equity/revenues of developers and construction companies to be eligible under the taxonomy.

b) Renovation of existing buildings: This activity includes both relative improvements (30 % against baselines) and comprehensive interventions on buildings and enables accounting project capital expenditure of renovation clients (including renovation costs unrelated to energy efficiency measures) and the equity/revenues of renovation companies to be eligible under the taxonomy.

c) Individual renovation measures, installation of renewables on-site and professional, scientific and technical activities: This activity covers:

   1) single technical interventions, enabling project capital expenditure of clients (including only costs related to the eligible measures) and the equity/revenues of installation companies to be eligible;

   2) services functional to building performance improvement, enabling project capital expenditure of clients and the equity/revenues of companies offering such services to be eligible under the taxonomy.

d) Acquisition and ownership of buildings: This activity covers the purchase of buildings, building ownership and improvement from an asset perspective and enables accounting project capital expenditure (related to the acquisition) and the revenues/equity of the owner to be eligible under the taxonomy. This activity also covers portfolios and real estate trusts.

5.4.7.2 Construction areas

The taxonomy for construction is given in Tables 62 to 64.

Table 62 — Construction of new buildings

Sector classification and activity	
Macro-sector	Construction
Description	Construction of new buildings To be eligible, all virgin timber used during the renovation for structures, cladding and finishes shall be sourced from sustainably managed forests. Examples of SFM programmes include the Forest Stewardship Council (FSC), Programme for the Endorsement of Forest Certification (PEFC) and Sustainable Forestry Initiative (SFI).
Sector criteria	
Potential environmental benefits	Construction of energy and resource efficient and low-GHG emission new buildings can make a substantial contribution to climate change mitigation by reducing net GHG emissions from the operational and construction phase of the building life cycle.

Table 62 *(continued)*

Environmental performance indicators	Potential environmental performance indicators include the following: — Efficiency is measured by appropriate indicators of primary energy and net GHG emissions both in the operational phase and along the life cycle (including embodied emissions). — Operational primary energy metric: The annual net primary energy demand during the operational phase of the building life cycle, expressed as kWh/m^2 per year. — Net GHG emissions: CO_2e/m^2 per year. — Embodied (indirect) net GHG emissions metric: net GHG emissions embodied into building materials during production, transportation and construction and end of life, expressed as kgCO_2eq/m^2; — The calculation methodology for the measurement of floor area (m^2) shall be disclosed with clear definition of what is within boundary.
Rationale	
The construction sector is responsible for significant net GHG emissions, although a large share of these emissions occurs during the operational phase of the product (i.e. the building) and can be considered as indirect emissions of construction activities. To minimize future operational emissions, new buildings shall be designed to ensure the lowest possible energy demand. For this reason, only new buildings designed to achieve the highest performance, taking into account local climate and market conditions, are eligible for the taxonomy. The energy performance of buildings standards (see the ISO 52000 series) should be used as the calculation methodology to determine the eligibility criteria of investments in buildings. Thermal resilience of the indoor environment of the buildings and outdoor environment around the buildings shall be designed. If an alternative scheme proves the respective scheme meets the performance criteria set in the taxonomy in a defined location, eligibility for the alternative scheme is accepted as a means to prove eligibility for the taxonomy criteria. In terms of energy consumption, the goal should be to electrify facilities and utilize renewable energy. The use of renewable energy sources, heating and cooling by electric heat pumps and acceptance from district heating and cooling are encouraged.	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
The main potential significant harm to the other environmental objectives from the construction of new buildings are determined by the following: — The building site will have impacts on ecosystems if built on greenfield land, especially in a conservation area or high biodiversity value area. The site will also have impacts on local air pollution and ecosystems if the building use entails large road transport demand. — The actual economic life span of the building and of its components/materials: the environmental impacts from producing the building materials and components can be minimized by increasing the building life span, adopting design solutions for adaptability and by maximizing the future potential of building material reuse and recycling, adopting design solutions for ease of deconstruction as well as through careful selection of components/materials that prioritizes recyclable materials and avoids hazardous substances.	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under “sector criteria” above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.
(3) Water	Minimize and manage the water consumption of the new building during the use stage (expressed as litres/person per day), especially within areas of water scarcity.

Table 62 *(continued)*

(4) Circular economy	Minimize construction and demolition waste generated on the construction site and reuse or send for recycling or other material recovery, including backfilling operations that use waste to substitute other materials. It is ensured that building components and materials do not contain asbestos or substances of very high concern which could present problems for recycling/reuse at end-of-life. Verification of design solutions to ensure adaptability and ease of deconstruction is carried out.
(5) Pollution	All materials, including recycled and reused materials, shall be fit for purpose and ensure no significant adverse human health or environmental impacts.
(6) Ecosystems	For buildings located in a protected area, or which include activities outside a protected area but likely to have a significant negative impact on its biodiversity, ensure that an appropriate assessment based on the conservation objectives of the protected area has been conducted in conformity with one of the following: — IFC Performance Standard 6, *Biodiversity Conservation and Sustainable Management of Living Natural Resources*; — an equivalent national standard. For such operations, a site-level biodiversity management plan shall be implemented.

Table 63 — Renovation of existing buildings

Sector classification and activity	
Macro-sector	Construction
Description	Renovation of existing residential and non-residential buildings To be eligible, all virgin timber used during the renovation for structures, cladding and finishes shall be sourced from sustainably managed forests. Examples of SFM programmes include the Forest Stewardship Council (FSC), Programme for the Endorsement of Forest Certification (PEFC) and Sustainable Forestry Initiative (SFI).
Sector criteria	
Potential environmental benefits	Renovation of existing buildings makes a substantial contribution to climate change mitigation by reducing energy use and net GHG emissions for the remaining operational phase of the buildings as well as by avoiding emissions that would occur through the construction of new buildings. In order to reduce CO_2 emissions from operational energy consumption during the cycle of construction, operation and demolition, it is important to select a heating system that contributes to decarbonization. As the heat source system cannot be easily replaced, it is important to choose a heating system that contributes to decarbonization at the time of new construction. Specifically, the electrification of heating facilities and the use of renewable energy sources shall be introduced as a top priority.
Environmental performance indicators	Potential environmental performance indicators are as follows: — Efficiency is measured by appropriate indicators of primary energy and net GHG emissions both in the use stage and along the life cycle (including embodied emissions). — Operational primary energy metric: The annual net primary energy demand during the use stage of the building life cycle, expressed as kWh/m^2 per year. — Net GHG emissions: CO_2e/m^2 per year — Embodied (indirect) net GHG emissions metric: net GHG emissions embodied into building materials during production, transportation and construction and end of life, expressed as $kgCO_2eq/m^2$. — The calculation methodology for the measurement of floor area (m^2) shall be disclosed with clear definition of what is within boundary.

Table 63 *(continued)*

Rationale	
Existing buildings are responsible for significant net GHG emissions, which can be considered as indirect emissions of renovation activities. To minimize future operational emissions, existing buildings shall be renovated to ensure lower energy demand and thus lower net GHG emissions. Although a considerable increase in building renovation rates is needed to accomplish climate change targets. The energy performance of buildings standards (see the ISO 52000 series) should be used as the calculation methodology to determine the eligibility criteria of investments in buildings. In terms of energy consumption, the goal should be to electrify facilities and utilize renewable energy. The use of renewable energy sources, heating and cooling by electric heat pumps and acceptance from district heating and cooling are encouraged.	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
The main potential significant harm to the other environmental objectives from the renovation of existing buildings are determined by the following: — The handling of building components that are likely to contain substances of concern (e.g. asbestos containing materials) and of any hazardous construction and demolition waste arising from the building renovation. — Ensuring the future possibility of reusing and recycling building components and materials through careful selection of components/materials that prioritizes recyclable materials and avoids hazardous substances.	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under “sector criteria” above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.
(3) Water	Minimize and manage the calculated water consumption of the new building during the use stage (expressed as litres/person per day), especially within areas of water scarcity.
(4) Circular economy	Minimize construction and demolition waste generated on the construction site and reuse or send for recycling or other material recovery, including backfilling operations that use waste to substitute other materials. Building components and materials do not contain asbestos or substances of very high concern which could present problems for recycling/reuse at end-of-life.
(5) Pollution	All materials, including recycled and reused materials, shall be fit for purpose and ensure no significant adverse human health or environmental impacts. Before starting the renovation work, a building survey shall be carried out by a competent specialist with training in asbestos surveying and in identification of other materials containing substances of concern. Any stripping or lagging that contains or is likely to contain asbestos, breaking or mechanical drilling or screwing or removal of insulation board, tiles and other asbestos containing materials shall be carried out by appropriately trained personnel, with health monitoring before, during and after the works.
(6) Ecosystems	For buildings located in a protected area, or which include activities outside a protected area but likely to have a significant negative impact on its biodiversity, ensure that an appropriate assessment based on the conservation objectives of the protected area has been conducted in conformity with one of the following: — IFC Performance Standard 6, *Biodiversity Conservation and Sustainable Management of Living Natural Resources*; — an equivalent national standard. For such operations, a site-level biodiversity management plan shall be implemented.

Table 64 — Real estate management activities

Sector classification and activity	
Macro-sector	Real estate management activities
Description	Acquisition of residential and non-residential buildings, including operations and maintenance.
Sector criteria	
Potential environmental benefits	The acquisition of energy and resource efficient and low net GHG emissions buildings instead of conventional, lower-performing ones can make a substantial contribution to climate change mitigation objectives by: a) creating demand for such buildings; this in turn will stimulate others to build and renovate buildings to a higher level of performance than they would have done otherwise; b) sending a clear signal to the market that the acquisition of such buildings against an ever more stringent legislative background and changing client preferences can help reduce future potential risk and value depreciation.
Environmental performance indicators	Environmental performance indicators can include the following: — Efficiency is measured by appropriate indicators of primary energy and net GHG emissions both in the use stage and along the life cycle (including embodied emissions). — Operational primary energy metric: The annual net primary energy demand during the use stage of the building life cycle, expressed as kWh/m^2 per year. — Net GHG emissions: CO_2e/m^2 per year — Embodied (indirect) net GHG emissions metric: net GHG emissions embodied into building materials during production, transportation and construction and end of life, expressed as $kgCO_2eq/m^2$. — The calculation methodology for the measurement of floor area (m^2) shall be disclosed with clear definitions of what is included within the area boundary.
Rationale	
The rationales sustaining the criteria established for building acquisition follow the same rationales employed to establish criteria for the construction of new buildings and the renovation of existing ones, to align the three sets of criteria to ensure consistency across the taxonomy on what constitutes an “energy and resource efficient building.” In terms of energy consumption, the goal should be to electrify facilities and utilize renewable energy. The use of renewable energy sources, heating and cooling by electric heat pumps and acceptance from district heating and cooling are encouraged.	
DNSH assessment (to evaluate impacts that are not the core environmental objective)	
The main sources of potential harm to other environmental objectives for the acquisition and ownership of buildings relate to the management of the buildings including operation, maintenance and renovation. As a pre-requisite, at the time of the acquisition of a building, the future building owner is expected to assess as part of its due diligence procedure the overall environmental condition of the building and its surrounds, such as contaminated soil and groundwater beneath and surrounding the building, presence of any dangerous building materials, and other chemical and biological risks. Any works which involve renovation or extension of the acquired building shall be carried out in accordance with the DNSH requirements for the activity renovation of existing buildings (residential and non-residential).	
(1) Climate mitigation	Activities within this sector/subsector are considered to contribute to this environmental objective, subject to the eligibility requirements described under “sector criteria” above.
(2) Adaptation	Reducing material physical climate risks and supporting system adaptation.
(3) Water	Minimize and manage the calculated water consumption of the new building during the use stage (expressed as litres/person per day), especially within areas of water scarcity.

Table 64 *(continued)*

(4) Circular economy	Minimize construction and demolition waste generated on the construction site and reuse or send for recycling or other material recovery, including backfilling operations that use waste to substitute other materials. It is ensured that building components and materials do not contain asbestos or substances of very high concern which could present problems for recycling/reuse at end-of-life.
(5) Pollution	All materials including recycled and reused material shall be fit for purpose and ensure no significant adverse human health or environmental impacts. Before starting the renovation work, a building survey shall be carried out by a competent specialist with training in asbestos surveying and in identification of other materials containing substances of concern. Any stripping or lagging that contains or is likely to contain asbestos, breaking or mechanical drilling or screwing or removal of insulation board, tiles and other asbestos containing materials shall be carried out by appropriately trained personnel, with health monitoring before, during and after the works. Assess and map all sewage or combined sewer/surface water drains and ensure all wastewater discharges from the building are conveyed to the public sewer or an appropriate wastewater treatment facility.
(6) Ecosystems	Maintain existing vegetated surface and natural water management components (such as ponds and permeable surfaces) around the building, which can provide habitat for local fauna and flora. For buildings located in a protected area, or which include activities outside a protected area but likely to have a significant negative impact on its biodiversity, ensure that an appropriate assessment based on the conservation objectives of the protected area has been conducted in conformity with one of the following: — IFC Performance Standard 6, *Biodiversity Conservation and Sustainable Management of Living Natural Resources*; — an equivalent national standard. For such operations, a site-level biodiversity management plan shall be implemented.

Annex A
(informative)

Guidance for climate change adaptation by sector

A.1 Agriculture and forestry, energy, water and telecommunications

A.1.1 Adaptation for growing of non-perennial crops

This subclause represents the potential activities covered by adaptation for agriculture (non-perennial crops), see Table A.1.

Table A.1 — Adaptation for growing of non-perennial crops

Sector classification and activity	
Macro-sector	Agriculture, forestry and fishing
Description	This group includes the growing of non-perennial crops, i.e. plants that do not last for more than two growing seasons. Included is the growing of these plants for the purpose of seed production. The growing of non-perennial crops, if done in an appropriate way, can reduce the risk of flash floods by enhancing infiltration and soil water retention. This classification should be applied to finance the transition from conventional agriculture activities to finance the development of an organic farm.
Adaptation criteria	
These criteria relate to adaptation of an economic activity. To be eligible for the taxonomy, the economic activity should meet the following qualitative screening criteria.	
Criterion A.1: Reducing material physical climate risk	The economic activity should reduce all material physical climate risks to the extent possible and on a best effort basis.
A.1.1	The activity integrates physical and non-physical measures aimed at reducing – to the extent possible and on a best effort basis – all material risks that have been identified through a risk assessment.
A.1.2	The above-mentioned assessment has the following characteristics: — considers both current weather variability and future climate change, including uncertainty; — is based on robust analysis of available climate data and projections across a range of future scenarios; — is consistent with the expected lifetime of the activity.
Criterion A.2: Supporting system adaptation	The economic activity should not adversely affect adaptation efforts of others.
A.2.1	The activity does not lead to increased climate risks for others or hamper adaptation elsewhere, for example, upstream flood defence causing increased risk downstream in a river basin.
A.2.2	The activity is consistent with sectoral, regional, or national adaptation efforts.
Criterion A.3: Monitoring adaptation results	The reduction of physical climate risks can be measured.
A.3.1	Adaptation results can be monitored and measured against defined indicators at least one of which should be reported as avoided losses in USD, EUR or CNY. Recognizing that risk evolves over time, updated assessments of physical climate risks should be undertaken at the appropriate frequency where possible.

Table A.2 provides examples of adaptation measures that can be adopted to reduce risks resulting from specific hazards for illustrative purpose only. Relevant climate-related hazards and required adaptation measures will be location- and context-specific and will be identified through the application of the qualitative screening criteria described above.

Table A.2 — Examples of adaptation measures for growing of non-perennial crops

Temperature-related – chronic			
Specific hazards	**Associated impacts**	**Illustrative examples of adaptation measures**	**Suggested performance metrics**
Temperature increase	Increase of specific plant diseases and insect infestations	Use of crops/varieties less susceptible to temperature-related diseases and pests Controlled agriculture (e.g. greenhouses, vertical farming, hydroponics) Use of integrated pest control measures (incl. chemical and biological measures) Use of multi-functional field margins (mffm) and (semi)natural vegetation (s)nv	% cropping area with less susceptible crops/ varieties % production from controlled agriculture % cropping area with integrated pest control measures % area with mffm and (s)nv within a defined region
Temperature-related – acute			
Specific hazards	**Associated impacts**	**Illustrative examples of adaptation measures**	**Suggested performance metrics**
Frost (outside “normal” periods)	Frost damage to susceptible crops	Use of crops/varieties less susceptible to frost Controlled agriculture (e.g. greenhouses, vertical farming, hydroponics) Use of irrigation (for some fruit crops)	% cropping area with less susceptible crops/ varieties % production from controlled agriculture % susceptible crop surface with irrigation
Water-related – chronic			
Specific hazards	**Associated impacts**	**Illustrative examples of adaptation measures**	**Suggested performance metrics**
Changing precipitation patterns and types	Yield losses due to reduced water availability, particularly after planting	Use of irrigation Enhancement of soil water retention (e.g. through use of cover crops, organic fertilizers, minimum tillage)	% cropping area with irrigation % cropping area with enhanced soil water retention
Water-related – acute			
Specific hazards	**Associated impacts**	**Illustrative examples of adaptation measures**	**Suggested performance metrics**
Drought	Yield losses	Use of crops/varieties less susceptible to drought Use of irrigation-controlled agriculture (e.g. greenhouses, vertical farming, hydroponics) Enhancement of soil water retention (e.g. through use of cover crops, organic fertilizers, minimum tillage)	% cropping area with less susceptible crops/ varieties. % cropping area with irrigation % production from controlled agriculture % cropping area with enhanced soil water retention

Table A.2 *(continued)*

Flooding of fields due to extreme precipitation or river flooding	Yield losses	Use of crops/varieties less susceptible to flooding Improved land drainage Set-aside of land in flood plain areas	% cropping area with less susceptible crops/ varieties. % cropping area with improved drainage % cropping area in flood plains
Solid mass related – chronic			
Specific hazards	**Associated impacts**	**Illustrative examples of adaptation measures**	**Suggested performance metrics**
Soil erosion (due to intensive precipitation or wind)	Yield losses	Soil conservation measures (e.g. use of cover crops, minimum/no tillage, wind breaks) Use of perennial crops/pasture in highly erosion susceptible areas. Set-aside of land in highly erosion susceptible areas	% cropping area with soil conservation measures % susceptible cropping area with perennial soil cover % susceptible cropping area set aside

A.1.2 Adaptation for silviculture and other forestry activities

This subclause represents the potential activities covered by silviculture and other forestry activities, see Table A.3.

Table A.3 — Adaptation for silviculture and other forestry activities

Sector classification and activity	
Macro-sector	Agriculture, forestry and fishing
Description	This class includes the growing of standing timber, planting, replanting, transplanting, thinning and conserving of forests and timber tracts, the growing of coppice, pulpwood and firewood and the operation for forest tree nurseries which are dedicated to climate change adaptation. A forest is defined as a minimum area of land of 0,05 ha to 1,0 ha with tree crown cover of more than 10 % to 30 % with trees having the potential to reach a minimum height of 2 m to 5 m at maturity *in situ*. A forest may consist either of closed forest formations where trees of various stories and undergrowth cover a high proportion of the ground or open forest. Young natural stands and all plantations which have yet to reach a crown density of 10 % to 30 % of tree height of 2 m to 5 m are included under forest, as are areas normally forming part of the forest area which are temporarily unstocked as a result of human intervention such as harvesting or natural causes, but which are expected to revert to forest. The activity itself can be made climate resilient through different measures, such as use of: — early warning systems or wildfire control measures (to reduce damages due to wildfires enhanced by heat waves); — regeneration material (species and ecotypes) less sensitive to strong wind or timely management of seedling stand and timely thinning (to reduce damage to forest stands from increased wind); — species and ecotypes less susceptible to drought or diversification of species and ecotypes (to minimize tree losses due to lack of water availability).
Adaptation criteria	
These criteria relate to adaptation enabled by this activity. To be eligible for the taxonomy, the economic activity should meet the following qualitative screening criteria.	

Table A.3 *(continued)*

Criterion A.1: Supporting adaptation of other economic activities	The economic activity contributes to adaptation of other activities or addresses systemic barriers to adaptation.
A.1.1	The activity reduces or facilitates adaptation to physical climate risks beyond the boundaries of the activity itself. This includes activities that: a) promote a new technology, product, practice or governance process or innovative uses of existing practices (including those related to natural infrastructure); b) remove information, financial, technological and capacity barriers to adaptation by others.
A.1.2	In the case of infrastructure-based activities, the economic activity should also meet the screening criteria A.1, A.2 and A.3 for adaptation of an economic activity.

Table A.4 provides examples of ways this activity can contribute to reduce physical climate risk of other economic activities.

Table A.4 — Examples of adaptation measures for silviculture and other forestry activities

Climate-related hazards	Associated physical climate risk	How does the activity contribute to reduce physical climate risks
Temperature-related (acute) – heat waves	Health impacts on (particularly elderly) people	Forests contribute to moderating extreme temperatures, particularly in densely populated areas
Wind-related (acute) – dust and sandstorms	Damage to crops and assets; interruption of traffic	Silviculture and other forestry activities contribute to reducing surface wind velocities and protect the surface from being eroded
Water-related (acute) – flash floods	Damage to people, livestock and assets	Forests enhance infiltration and retain water, thus reducing surface runoff and flooding
Solid-mass related (chronic and acute) – soil erosion, coastal erosion, landslides	Soil degradation, damage to people, livestock and assets	Forests provide protection against soil erosion, coastal erosion and landslides

A.1.3 Adaptation for production of electricity — Hydropower

This subclause represents the potential activities covered by the production of electricity (hydropower), see Table A.5.

Table A.5 — Adaptation for production of electricity — Hydropower

Sector classification and activity	
Macro-sector	Renewable energy and energy efficiency
Description	This class includes the generation of electricity using hydropower, covering both dam storage and run-of-the-river hydropower generation facilities. Improving the climate resilience of hydropower electricity generation can improve the climate resilience of other sectors that rely on electricity, especially in countries where a high proportion of the electricity supply is generated by hydropower.
Adaptation criteria	
These criteria relate to adaptation of an economic activity. To be eligible for the taxonomy, the economic activity should meet the following qualitative screening criteria.	
Criterion A.1: Reducing material physical climate risk	The economic activity should reduce all material physical climate risks to the extent possible and on a best effort basis.

Table A.5 *(continued)*

A.1.1	The activity integrates physical and non-physical measures aimed at reducing - to the extent possible and on a best effort basis - all material risks that have been identified through a risk assessment.
A.1.2	The above-mentioned assessment has the following characteristics: — considers both current weather variability and future climate change, including uncertainty; — is based on robust analysis of available climate data and projections across a range of future scenarios; — is consistent with the expected lifetime of the activity.
Criterion A.2: Supporting system adaptation	The economic activity should not adversely affect adaptation efforts of others.
A.2.1	The activity does not lead to increased climate risks for others or hamper adaptation elsewhere, for example, upstream flood defence causing increased risk downstream in a river basin.
A.2.2	The activity is consistent with sectoral, regional or national adaptation efforts.
Criterion A.3: Monitoring adaptation results	The reduction of physical climate risks can be measured.
A.3.1	Adaptation results can be monitored and measured against defined indicators. Recognizing that risk evolves over time, updated assessments of physical climate risks should be undertaken at the appropriate frequency where possible.

Table A.6 provides examples of adaptation measures that can be adopted to reduce risks resulting from specific hazards for illustrative purpose only. Relevant climate-related hazards and required adaptation measures will be location and context specific and will be identified through the application of the qualitative screening criteria described above.

Table A.6 — Examples of adaptation measures for the production of electricity — Hydropower

Wind-related – acute			
Specific hazards	**Associated impacts**	**Illustrative examples of adaptation measures**	**Suggested performance metrics**
Cyclones Hurricanes Typhoons	Physical damage to hydropower facilities	Adoption of structural strengthening of hydropower facilities (e.g. dams, spillways turbine houses, switchyards, ancillary infrastructure) Adoption of hydro-meteorological monitoring and forecasting equipment	Reduction in downtime due to acute "wind" events (days) Reduction in annual damage due to acute "wind" events (USD, EUR, CNY)
Water-related – chronic			
Specific hazards	**Associated impacts**	**Illustrative examples of adaptation measures**	**Suggested performance metrics**
Changing precipitation patterns Hydrological variability	Reduced water flows through turbines Increased variability of water flows through turbines	Adoption of turbines capable of operating at low or variable flow conditions	Increased electricity production (MWh)
		Adoption of increased dam storage capacity	As above
		Adoption of hydro-meteorological monitoring and forecasting equipment	As above

Table A.6 *(continued)*

Water-related – acute			
Specific hazards	**Associated impacts**	**Illustrative examples of adaptation measures**	**Suggested performance metrics**
Droughts	Insufficient water flowing through turbines	Adoption of turbines capable of operating at low or variable flow conditions	Increased electricity production (MWh)
		Adoption of increased dam storage capacity	As above
		Adoption of hydro-meteorological monitoring and forecasting equipment	As above
Extreme Precipitation Events Floods Glacial lake outburst floods (GLOFs)	Physical damage to hydropower facilities	Adoption of structural strengthening of hydropower facilities (e.g. dams, spillways, turbine houses, switchyards, ancillary infrastructure)	Reduction in downtime due to acute "water" events (days) Reduction in annual damage due to acute "water" events (USD, EUR, CNY)
		Adoption of hydro-meteorological monitoring and forecasting equipment	As above
Solid mass related – chronic			
Specific hazards	**Associated impacts**	**Illustrative examples of adaptation measures**	**Suggested performance metrics**
Soil erosion	Loss of dam storage capacity	Adoption of sediment dredging or other sediment management measures	Increased dam storage capacity (km^3)
	Sediment damage to turbines	Adoption of sediment-resistant turbines	Reduction in annual damage caused by sediment (USD, EUR, CNY)
Solid mass-related – acute			
Specific hazards	**Associated impacts**	**Illustrative examples of adaptation measures**	**Suggested performance metrics**
Avalanche Landslide	Physical damage to hydropower facilities	Adoption of structural strengthening of hydropower facilities (e.g. dams, spillways, turbine houses, switchyards, ancillary infrastructure)	Reduction in downtime due to acute "land mass" events (days) Reduction in annual damage due to acute "land mass" events (USD, EUR, CNY)
		Adoption of early warning monitoring equipment	As above
		Adoption of emergency response systems and equipment	As above

A.1.4 Adaptation for transmission lines

This subclause represents the potential activities covered by transmission lines, see Table A.7.

Table A.7 — Adaptation for transmission lines

Sector classification and activity	
Macro-sector	Renewable energy and energy efficiency
Description	This class includes the operation of transmission systems that convey the electricity from the generation facility to the distribution system. Improving the resilience of electricity transmission also increases the resilience of operations that depend on electricity.
Adaptation criteria	
These criteria relate to adaptation of an economic activity. To be eligible for the taxonomy, the economic activity should meet the following qualitative screening criteria.	
Criterion A.1: Reducing material physical climate risk	The economic activity should reduce all material physical climate risks to the extent possible and on a best effort basis.
A.1.1	The activity integrates physical and non-physical measures aimed at reducing - to the extent possible and on a best effort basis - all material risks that have been identified through a risk assessment.
A.1.2	The above-mentioned assessment has the following characteristics: — considers both current weather variability and future climate change, including uncertainty; — is based on robust analysis of available climate data and projections across a range of future scenarios; — is consistent with the expected lifetime of the activity.
Criterion A.2: Supporting system adaptation	The economic activity should not adversely affect adaptation efforts of others.
A.2.1	The activity does not lead to increased climate risks for others or hamper adaptation elsewhere, for example, upstream flood defence causing increased risk downstream in a river basin.
A.2.2	The activity is consistent with sectoral, regional, or national adaptation efforts.
Criterion A.3: Monitoring adaptation results	The reduction of physical climate risks can be measured.
A.3.1	Adaptation results can be monitored and measured against defined indicators. Recognizing that risk evolves over time, updated assessments of physical climate risks should be undertaken at the appropriate frequency where possible.

Table A.8 provides examples of adaptation measures that can be adopted to reduce risks resulting from specific hazards for illustrative purposes only. Relevant climate-related hazards and required adaptation measures will be location and context specific and will be identified through the application of the qualitative screening criteria described above.

Table A.8 — Examples of adaptation measures for transmission lines

Temperature-related – chronic			
Specific hazards	**Associated impacts**	**Illustrative examples of adaptation measures**	**Suggested performance metrics**
Changing temperature (increase)	Reduced thermal rating (i.e. the maximum current allowed at a given temperature), causing lines to sag to dangerous levels	Increasing the height of poles supporting power lines. Installing conductors with hotter operating limits. Using "low-sag" conductors	Reduction of efficiency losses during period of temperature > design temperature
Temperature-related – acute			
Specific hazards	**Associated impacts**	**Illustrative examples of adaptation measures**	**Suggested performance metrics**
Heat waves	Overheating of lines and transformers causing them to trip off Electricity disruptions due to grid overload during higher peak energy Demands – e.g. air conditioned air, ice production	Integrate higher temperatures into design calculation for maximum temperature/rating Increase system capacity by adding external coolers to transformers Increase system capacity by increasing height of the poles or otherwise increasing tension on the line to reduce sag	System average interruption duration index or system average Interruption frequency index after adaptation compared to before Adaptations
Wind-related – chronic			
Specific hazards	**Associated impacts**	**Illustrative examples of adaptation measures**	**Suggested performance metrics**
Changing wind speeds	Downed transmission lines or gradual weakening of infrastructure leading to more frequent repairs	Adjust wind loading standards Reroute power lines away from sensitive objects or move them underground	Reduced repair costs
Wind-related – acute			
Specific hazards	**Associated impacts**	**Illustrative examples of adaptation measures**	**Suggested performance metrics**
Hurricanes/typhoons	Downed or damaged transmission lines, substations or poles due to wind and rain, leading to disruptions Debris or trees damaging lines or poles causing short circuit	Adjust wind loading standards Reroute power lines away from sensitive objects or move underground Improve hurricane forecasting Redefine technical standards so that grid operators are required to build in resilience	Reduced repair costs or decreased number of downed power lines during storms
Winter storm	Potential for ice build-up disrupting transmissions	Improve forecasting of ice storms' impact on overhead lines and transmission circuits Improve forecasting of winter storms Enhance design standards to withstand larger ice loading	Accuracy of impact projection and of storm forecasting Reduced transmission disruptions during winter storms

Table A.8 *(continued)*

Water-related – chronic			
Specific hazards	**Associated impacts**	**Illustrative examples of adaptation measures**	**Suggested performance metrics**
Water scarcity	Potential for energy supply disruptions from sources that rely on hydropower Potential for overheating of generation equipment that relies on water for cooling, which could lead to transmission disruptions	Incorporate rainfall projections and drought forecasting into reservoir management strategies Explore alternative water sources such as water banks, water supply contracts, groundwater wells, processed wastewater	Reservoir levels maintained above a critical level Throughout the dry season, months or years
Water-related – acute			
Specific hazards	**Associated impacts**	**Illustrative examples of adaptation measures**	**Suggested performance metrics**
Flash flooding	Inundation and potential damage to pipelines, towers, substations, or infrastructure	Relocate assets into areas that are not located in flood plains Waterproof pipelines, substations, etc. Incorporate submergible transformers, switches, pumps	Proportion of critical assets waterproofed and located outside of flood plains
		Seal manhole covers	
Solid mass related – chronic			
Specific hazards	**Associated impacts**	**Illustrative examples of adaptation measures**	**Suggested performance metrics**
Soil erosion	Electricity poles or pipelines made unstable	Replant any disturbed soil around asset	Reduced costs of re-establishing poles or pipelines
Solid mass-related – acute			
Specific hazards	**Associated impacts**	**Illustrative examples of adaptation measures**	**Suggested performance metrics**
Landslide	Toppled electricity poles Buried pipelines or other transmission infrastructure, making them harder to reach in case of repairs	Relocate electricity poles away from areas prone to landslide Plant vegetation on empty hillsides above critical infrastructure	Proportion of electricity poles located in areas prone to landslide Reduced repair costs

A.1.5 Adaptation for sewerage

This subclause represents the potential activities covered by sewerage, see Table A.9.

Table A.9 — Adaptation for sewerage

Sector classification and activity	
Macro-sector	Water supply; sewerage, waste management and remediation activities
Description	This class includes the operation of sewer systems or sewage treatment facilities that collect, treat, and dispose of sewage, and in particular:
	— operation of sewer systems or sewer treatment facilities; — collection and transport of human or industrial wastewater from one or several users, as well as rainwater by means of sewerage networks, collectors, tanks and other means of transport (sewage vehicles, etc.);