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Development of the EU Sustainable Finance Taxonomy – A framework for defining substantial contribution for environmental objectives 3-6

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Abstract

The European Union has introduced a new policy tool to define which investments can be considered environmentally sustainable: a taxonomy of environmentally sustainable economic activities (the 'EU taxonomy'). Regulation (EU) 2020/852 of the European Parliament and the Council[1] (the 'Taxonomy Regulation'), establishes the framework for its development and use. It empowers the European Commission to define the actual taxonomy, i.e. the list of economic activities and associated technical screening criteria setting out the required level of environmental performance. This list of economic activities and the accompanying technical screening criteria will be adopted in delegated acts. The first delegated act[2] has been already adopted. It defines technical screening criteria for activities making a substantial contribution to climate change mitigation and adaptation. A future delegated act will define the technical screening criteria for economic activities making a substantial contribution to the four remaining environmental objectives: Sustainable use and protection of water and marine resources; Transition to a circular economy; Pollution prevention and control and Protection and restoration of biodiversity and ecosystems. However, limited literature exists in sustainable finance for defining environmental performance thresholds at economic activity level for these environmental objectives.

This report proposes a methodological framework and a step-by-step process to draft criteria for economic activities substantially contributing to the four remaining environmental objectives. From the identification of the type of substantial contribution the economic activity can make, the selection of the most suitable approach to draft the technical screening criteria and the setting of the level of ambition expected to consider that contribution substantial. The report then explores how the conceptual framework can be applied in practice for each of the four environmental objectives.

A key result from the framework is to define seven approaches for setting technical screening criteria and to assess their strengths and weakness. One such approach is, performance in relation to an environmental target, whereby an activity qualifies if it achieves a certain level of performance derived from existing targets. The methodological framework also considers the different nature of each environmental objective and thus establish different types of substantial contribution for each. For example, the report identifies how an activity can make a substantial contribution to the 'transition to a circular economy' objective through circular design and production.

The methodology builds on the work by the Technical Expert Group on Sustainable Finance (TEG) and by the Joint Research Centre (JRC) along with other European Commission services on defining 'substantial contribution' and developing technical screening criteria for activities making a substantial contribution to climate change mitigation and adaptation. The Taxonomy Regulation establishes a group of experts, the Platform on Sustainable Finance (PSF), to advise the European Commission on technical screening criteria to be included in the Taxonomy Regulation. Therefore, this methodology was shared at the beginning of the mandate of the PSF as an input to their technical recommendations.

[1] Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088, O.J. L 198, 22.06.2020.

[2] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=PI_COM%3AC%282021%292800

Executive summary

In line with its 2018 action plan on financing sustainable growth, the European Union created a sustainable finance tool – the EU taxonomy – designed to facilitate sustainable investments and orient capital towards activities that will help the EU deliver on the European Green Deal. The EU taxonomy is a list of economic activities with technical screening criteria which define under which conditions they are considered to make a substantial contribution to the EU's environmental objectives. A first set of criteria for economic activities making a substantial contribution to climate change mitigation and climate change adaptation was adopted as a delegated act[3] under the Taxonomy Regulation in June 2021.

Another delegated act will also define technical screening criteria for economic activities making a substantial contribution to each of the four remaining environmental objectives (Sustainable use and protection of water and marine resources; Transition to a circular economy; Pollution prevention and control and Protection and restoration of biodiversity and ecosystems). The Platform on Sustainable Finance's recommendations will help the European Commission in preparing this delegated act. The Platform on Sustainable Finance is an expert group established under the Taxonomy Regulation to, *inter alia*, provide the Commission with recommended technical screening criteria whose work started in October 2020.

This report aims to provide a robust methodology for the further development of the EU taxonomy. In particular, it focuses on how to define the substantial contribution that an activity has to make, *inter alia*, to be deemed taxonomy-aligned for the four non-climate environmental objectives. The methodology builds on the recommendations developed from 2018 to 2020 by the Technical Expert Group on Sustainable Finance (TEG) for economic activities that make a substantial contribution to climate change mitigation and adaptation as well as on the work by European Commission services in preparation of the first delegated act. It also furthers the methodology developed by the European Commission's Joint Research Centre (JRC) for defining substantial contribution to climate change mitigation[4]. An earlier version of the methodology described in this report was shared with the Platform at the beginning of their work, however, important conceptual and legal discussions since have helped to develop certain aspects of the methodology as presented in this report.

The report first analyses the types of substantial contribution an activity can make. For each environmental objective, a set of substantial contribution (SC) types is defined:

- Sustainable use and protection of water and marine resources: SC 1 – An activity with positive impact; SC 2 – An activity leading to an improvement in another activity; SC 3 – An activity dealing with pressures from other activities; SC – 4 An activity with pressures substantially lower than sector average.
- Transition to a circular economy: SC 1 – Circular design and production; SC 2 – Circular use; SC 3 – Circular Value Recovery; SC 4 – Circular support
- Pollution prevention and control: SC 1A – Reducing direct emissions of pollutants: SC 1B – Designing out indirect pollution: SC 2 – Cleaning out pollution: SC 3 – Enabling activities.
- Protection and restoration of biodiversity and ecosystems: SC 1A – Conserving the state of semi-natural or natural ecosystems; SC 1B – Improving the state of semi-natural or natural ecosystems; SC 2A – Maintaining sustainable use of managed ecosystems; SC 2B – Reducing the pressure on managed ecosystems; SC 3 – Mitigating previous impacts; SC 4 – Enabling activities.

[3] [3] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=PI_COM%3AC%282021%292800

[4] Canfora et al, 2021 Substantial contribution to climate change mitigation – a framework to define technical screening criteria for the EU taxonomy, https://publications.jrc.ec.europa.eu/repository/handle/JRC123355?mode=full

It then provides an overview of the seven approaches used to draft technical screening criteria in the EU taxonomy so far, which are: Impact-based approach; Performance in relation to the environmental target; Best-in-class performance; Relative improvement; Practice-based; Process-based; and Nature of the activity. The report also discusses the strengths and weaknesses of the approaches, their dependency on the activities assessed and likelihood of using each approach for different environmental objectives. This reveals that no individual approach is more suitable in all cases. The selection of the most suitable approach entails an activity-by-activity assessment and due consideration of trade-offs between the requirements the criteria has to fulfil. The report then focuses on guidance for defining a level of ambition. The level of ambition determines the performance required by technical screening criteria for activities making a substantial contribution to an environmental objective. Guidance is provided to set the level of ambition based on science and policy reference points.

Together, these sections constitute a step-by-step methodology for the drafting of technical screening criteria that define activities making a substantial contribution to an environmental objective. The steps for establishing technical screening criteria defined in the methodology are:

- Step 0: Starting point
- Step 1: How can the activity make a substantial contribution to the objective
- Step 2: Define the scope of the activity
- Step 3: Types of Substantial Contribution
- Step 4: Reference Points
- Step 5: Selecting the approach
- Step 6: Level of ambition
- Step 7: Define criteria

The report also flags horizontal questions and challenges that the Platform on Sustainable Finance is likely to address when providing their recommendations of technical screening criteria for the economic activities making a substantial contribution for the four remaining environmental objectives of the EU taxonomy. This report does not pre-empt the Platform on Sustainable Finance's conclusions on these specific horizontal questions and challenges.

Acknowledgements

This report has greatly benefited from the collective contribution of a large number of colleagues from multiple Directorate-Generals across the European Commission (DG AGRI, DG CLIMA, DG ENER, DG ENV, ESTAT, DG FISMA, DG GROW, JRC, DG MARE and DG RTD) as well as from the European Environment Agency (EEA) and the European Investment Bank (EIB). The authors would like to thank all of them for the very valuable input and feedback provided.

The analysis in this report draws upon the work performed by the Technical Expert Group on Sustainable Finance (TEG) between 2018 and 2020 and the Platform on Sustainable Finance (the Platform) between 2020 and the present day. Thanks to all TEG and Platform members for setting the fundamental basis on which this framework is built and contributing to its further development. Special thanks to Platform members Ben Allen (IEEP, Belgium), Ingmar Juergens (GSFCG, Germany), Eva Mayerhofer (EIB, European) and Nick Marchesi (EIB, European) as well as Anne Teller (European Commission DG ENV, European) and Beyhan Ekinci (BfN, Germany) for their work on the types of substantial contribution for the protection and restoration of biodiversity and ecosystems.

Finally, this work would not have been possible without the great support provided by Kevin Flowers, Julian Mclachlan and Bettina Kretschmer from DG ENV, and Dries Huygens and Alessandra la Notte from JRC. The authors are grateful for their extremely valuable advice all along the way.

The individuals and organisations that contributed to this work are not responsible for any views that this report contains. The views expressed and all errors or emissions are solely the responsibility of the authors.

A. THIS REPORT

Aims of the report

The report aims at facilitating the development of technical screening criteria for the EU taxonomy. It provides a conceptual framework to address the two key dimensions of defining substantial contribution: the choice of the approach to defining substantial contribution, and the guidelines for setting the level of ambition.

The Taxonomy Regulation[5] defines the uses of the EU taxonomy and the framework to develop it, but it does not contain the Taxonomy itself. Instead, it empowers the European Commission, advised by the Platform on Sustainable Finance (the Platform), to develop the actual Taxonomy (i.e. the list of activities* with technical screening criteria*[6]) as Delegated Acts under the regulation. In particular, the Taxonomy Regulation sets out that activities can be included if, *inter alia*, they make a substantial contribution to one of the environmental objectives. However, it leaves up to the Delegated Acts to define, by means of technical screening criteria for each generic economic activities*, the level of ambition and hence what a substantial contribution is.

In order to meet the requirements in Art. 19 of the Taxonomy Regulation, a robust framework to help calibrate and define what a substantial contribution is for each objective is needed. Without such a framework, setting the criteria for each generic activity becomes ad-hoc and the risks of not meeting the Art. 19 requirements are considerable. Such a framework needs to provide a clear methodology and process that can be applied to any activity. Furthermore, providing methodological guidance, it has the potential to improve the efficiency of developing the EU taxonomy.

This report builds on the experience of the work by Commission services and with the TEG[7] in the development of technical screening criteria and in the preparation of the delegated act for activities making a substantial contribution to the climate objectives. It uses these learnings and the experience of working with the Platform to investigate and set out suggestions on how substantial contribution can be set for each of the other 4 remaining environmental objectives. Note that, despite similitudes, this report does not directly address the setting of Do Not Significant Harm (DNSH) criteria.

The views in this report were shared with and updated alongside the Platform on Sustainable Finance. A first version was shared with the Platform as an input at the beginning of their work, however, important conceptual and legal discussions since have helped to develop the methodology to the point presented in this report. Further developments in the methodology may occur as work on developing technical screening criteria progresses.

[5] Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088 (Text with EEA relevance)

[6] Terms followed by an asterisk are defined in the glossary at the end of the report

[7] TEG: Technical Export Group on Sustainable Finance, which delivered its final recommendations to the European Commission for a climate taxonomy in March 2020

How to read this report

Readers with different backgrounds will derive different benefits from reading this report and can prioritise the most relevant sections for their purposes.

Section B will get you up to speed if you are not yet familiar with the EU taxonomy: this contextual section introduces the origin and implications of the EU taxonomy and the steps taken so far, especially the work by the TEG. Section B also describes the next steps in the EU taxonomy development and the 'Taxo4' project of which this report is the final outcome.

Section C covers the conceptual framework to establish a methodology to further develop the EU taxonomy in a robust way. This is, in principle, valid for all objectives and activities.

Sections D to G are each specific to an environmental objective and propose considerations to take into account when developing the criteria for each objective. These sections implement the conceptual framework introduced in Section C.

Finally, **Section H** covers horizontal considerations to keep in mind and reflect upon when embarking in the current phase of EU taxonomy development.

A **glossary** of key concepts can be found at the end of the report. The words defined in the glossary are marked with an *.

B. Context – The EU taxonomy for Sustainable Finance

B.1 The case for an EU taxonomy

The European Union (EU) is committed to pursuing a new economic growth strategy - the 'European Green Deal' - that aims to transform the EU into a modern, resource-efficient and competitive economy while reaching its 2030 climate and energy goals and becoming climate-neutral by 2050[8]. This will entail a very profound transformation of our economy. As set out in the European Green Deal, the EU will also pursue ambitious goals: to reverse the alarming declines in biodiversity and ecosystem health; to move towards a zero pollution ambition; to protect the EU's natural capital and citizens' health and well-being; to transition to lower environmental footprint, resource-efficient and circular economy paradigm.

This transformation to a more sustainable EU economy will help contribute to achieving international climate and environmental objectives, such as those set in the Paris Agreement[9], notably to hold the increase in the global average temperature below 2 °C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5 °C above pre-industrial levels.

Addressing climate and environmental challenges in the EU and globally requires tremendous investments and innovations across sectors and in a variety of applications, both by the public and private sector, as well as mobilising finance, notably from private sources. In the EU, investments to mitigate climate change and achieve the EU's climate and energy targets set for 2030 will need to be increased by around EUR 260 billion per year. Further additional investments in the range of EUR 100-150 billion per year are needed to achieve the EU's broader environmental objectives[10].

The European Commission adopted the 'European Green Deal Investment Plan' on 14 January 2020[11] to mobilise at least EUR 1 trillion of sustainable investments over the next decade. The European Green Deal Investment Plan builds on three pillars: (1) Unlocking private finance through public funding; (2) enabling frameworks for private investors and the public sector; (3) enhancing technical support to identify and structure sustainable investments.

Mobilising finance for investments that have a high positive climate and environmental impact is essential for the success of the EU's sustainable growth strategy and environmental agenda. The European Commission adopted its 'Action Plan on financing sustainable growth' already in March 2018[12], setting out a comprehensive strategy on sustainable finance. Furthermore, the European Commission has adopted in July 2021 a renewed 'Sustainable Finance strategy'[13], which builds on the Action Plan and complement the European Green Deal Investment Plan, while supporting its implementation.

A key objective of the Action Plan on financing sustainable growth is to reorient capital flows to sustainable investments. Such reorientation of capital requires a common understanding, among investors and other stakeholders across the EU, of what a sustainable investment is. It is for this reason that the most important and urgent action under the Action Plan concerns the establishment of a unified, EU-wide classification system for sustainable activities (EU taxonomy) to help investors and companies determine which activities qualify as environmentally sustainable. In the current phase, the EU taxonomy deals with classifying activities that are environmentally sustainable. At a later stage, the EU taxonomy might be extended to the social dimension of sustainability. As per Article 26(2)(a) of the Taxonomy Regulation, the Commission will publish a separate report describing

[8] European Commission Communication 'The European Green Deal' of 11.12.2019, COM(2019) 640 final
[9] Paris Agreement under the United Nations Framework Convention on Climate Change adopted on 12 December 2015
[10] Note: The September 2020 Speech on the State of the Union has raised the continental ambition to go from 40% to 55% reduction in GHG emissions by 2030 compared to the 1990 levels. As for today, the additional investment needs have not been quantified.
[11] European Commission Communication 'European Green Deal Investment Plan' of 14.1.2020, COM(2019) 21 final
[12] COM (2018) 097 final
[13] https://ec.europa.eu/info/publications/210706-sustainable-finance-strategy_en

the provisions that would be required to extend the scope of the Taxonomy Regulation to a Social Taxonomy.

B.2 The Taxonomy Regulation

B.2.1 The legal framework

In order to establish an EU taxonomy, the European Commission proposed a legal framework, in the form of a Regulation, to the Council and the European Parliament in May 2018.[14] This Regulation on the establishment of a framework to facilitate sustainable investments (the 'Taxonomy Regulation') was formally adopted on 18th of June 2020[15] and sets out the principles for the EU taxonomy. These notably include, for six environmental objectives, the principle that an environmentally sustainable economic activity must substantially contribute to at least one environmental objective and do no significant harm to any other objective.

The Taxonomy Regulation also provides a general framework for the development of the EU taxonomy itself, i.e. a list of activities together with performance criteria for determining when a specific activity*[16] can be considered to (i) make a substantial contribution ('SC') to meeting one or more of the 6 environmental objectives whilst (ii) doing no significant harm ('DNSH') to any of the 5 other objectives. In other words, the activity 'manufacture of iron and steel' is not, *per se*, sustainable simply because it is listed in the taxonomy. But when the (SC and DNSH) technical screening criteria* are met, for a specific activity (e.g. a steel manufacturing plant), then that specific activity can be considered as 'sustainable' and taxonomy-aligned.

The EU taxonomy does not itself define sustainable financial products, but sets out the criteria to determine to what extent a financial product is aligned with the taxonomy. The detail of what constitutes an environmentally sustainable activity will be built up gradually over time through detailed delegated legislation, allowing investors and companies to determine whether certain activities qualify as environmentally sustainable (i.e. whether certain projects/ activities substantially contribute to the transition towards a low carbon, and climate-resilient economy, and to other EU environmental goals).

The EU taxonomy aims to act as a financial driver to reach the EU environmental and climate policy objectives (such as the Paris 2030 targets, the EU Biodiversity Strategy, the zero waste and zero pollution ambitions, etc.) as presented in the Taxonomy Regulation recitals.

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*As the EU taxonomy defines environmental sustainability on the level of economic activities, it is worth **defining the exact meaning of the term 'economic activity'**. The Taxonomy Regulation does not define the concept. The term is borrowed from NACE, the statistical classification of economic activities in the EU[17]. The Eurostat publication on NACE[18] defines that 'an economic activity takes place when resources such as capital goods, labour, manufacturing techniques or intermediary products are combined to produce specific goods or services. Thus, an economic activity is characterized by an input of resources, a production process and an output of products (goods or services).'*

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[14] COM(2018) 353, 23.5.2018

[15] EU 2020/852 (Regulation of the European Parliament and of the council on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088)

[16] Terms followed by an asterisk are defined in the glossary at the end of the report

[17] Regulation (EC) No 1893/2006

[18] NACE Rev. 2 – Statistical classification of economic activities

The different levels of NACE, however define strictly speaking a 'category of activities', not a single economic activity as defined before.

Likewise, strictly speaking, the EU taxonomy sets criteria for a 'category of activity' such as for 'electricity production from solar PV'. The activities that fall into this category can take place in different contexts and locations, are carried out by different companies and under specific circumstances. The term 'economic activity' therefore accurately only describes the latter. With regard to applying the EU taxonomy, only when an economic activity is carried out on site (i.e. we refer to an individual embodiment within a certain economic activity category), it is possible to check if the activity complies with the criteria. This difference is important to understand.

*However, for the sake of simplicity and to stick with the TEG's wording, this report will refer to 'economic activity' for both, the category of activities that is assigned certain criteria (also named '**generic activity**'), and the economic activity that is carried out on-site and which complies (or not) with the criteria (also named '**specific activity**').*

B.2.2 Content of the taxonomy

The Taxonomy Regulation defines six environmental objectives:

1. climate change mitigation;
2. climate change adaptation;
3. the sustainable use and protection of water and marine resources;
4. the transition to a circular economy;
5. pollution prevention and control;
6. the protection and restoration of biodiversity and ecosystem.

For each of the six environmental objectives, the Taxonomy Regulation, in **articles 10-15, provides a list of means to reach substantial contribution** to each of the environmental objectives. **Article 17** instead, outlines what is meant for each objective by '**do no significant harm' to the environmental objective**.

The **Technical Screening Criteria** will spell out the conditions for each economic activity considered are defined by the European Commission in Delegated Acts. The Delegated Act to define the technical screening criteria for activities substantially contributing to climate change mitigation and adaptation ('climate Delegated Act') i.e. the first two of the six objectives as defined in the Taxonomy Regulationwas adopted in June 2021. Other delegated legislation for activities substantially contributing to the remaining four environmental objectives is planned for adoption in 2022.

To be Taxonomy-aligned, an activity also needs to meet a set of **minimum (social) safeguards** spelled out in the Taxonomy Regulation. They should ensure that procedures implemented by an undertaking that is carrying out an economic activity to ensure the alignment with the OECD Guidelines for Multinational Enterprises and the UN Guiding Principles on Business and Human Rights, including the principles and rights set out in the eight fundamental conventions identified in the

Declaration of the International Labour Organisation on Fundamental Principles and Rights at Work and the International Bill of Human Rights.

The Taxonomy Regulation also stipulates conditions for two particular subsets of activities that can make a substantial contribution (see details in C.2). Notably, it defines:

Enabling activities (Article 16)**:** An economic activity shall qualify as contributing substantially to one or more of the objectives by directly enabling other activities to make a substantial contribution to one or more of those objectives, provided that such economic activity:

(a) does not lead to a lock-in of assets that undermine long-term environmental goals, considering the economic lifetime of those assets; and

(b) has a substantial positive environmental impact on the basis of life-cycle considerations.

The manufacture of low-carbon technology (such as components essential for renewable energy technologies) is an example of enabling activities from the TEG report.

Transitional activities[19] (Article 10(2))**:** An economic activity for which there is no technologically and economically feasible low-carbon alternative shall qualify as contributing substantially to climate change mitigation where it supports the transition to a climate-neutral economy consistent with a pathway to limit the temperature increase to 1,5 ^{0}C above pre-industrial levels, including by phasing out greenhouse gas emissions, in particular emissions from solid fossil fuels, and where that activity:

(a) has greenhouse gas emission levels that correspond to the best performance in the sector or industry;

(b) does not hamper the development and deployment of low-carbon alternatives; and

(c) does not lead to a lock-in of carbon-intensive assets, considering the economic lifetime of those assets.

The manufacture of cement (with a threshold on the specific emissions that is only met by the best performing activities) is an example of transitional activity from the TEG report.

B.2.3 Use of the EU taxonomy

The Taxonomy Regulation sets out three groups of taxonomy users:

1. financial market participants[20] offering financial products[21] in the EU
2. large companies who are already required to provide a non-financial statement under the Non-Financial Reporting Directive (NFRD)[22]; and
3. the EU and Member States, when setting public measures, standards or labels for green financial products or green (corporate) bonds.

For each relevant product, the financial market participant will be required to state:

- how and to what extent they have used the EU taxonomy in determining the sustainability of the underlying investments;

[19] Transitional activities are defined for the climate change mitigation only in the Taxonomy Regulation. This, however, does not preclude using a similar concept for the other five objectives

[20] Financial market participants are defined in Regulation (EU) 2019/2088 of the European Parliament and of the Council of 27 November 2019 on sustainability-related disclosures in the financial services sector, Article 2 as: (a) an insurance undertaking which makes available an insurance-based investment product (IBIP); (b) an investment firm which provides portfolio management; (c) an institution for occupational retirement provision (IORP); (d) a manufacturer of a pension product; (e) an alternative investment fund manager (AIFM); (f) a pan-European personal pension product (PEPP) provider; (g) a manager of a qualifying venture capital fund registered in accordance with Article 14 of Regulation (EU) No 345/2013; (h) a manager of a qualifying social entrepreneurship fund registered in accordance with Article 15 of Regulation (EU) No 346/2013; (i) a management company of an undertaking for collective investment in transferable securities (UCITS management company); or (j) a credit institution which provides portfolio management.

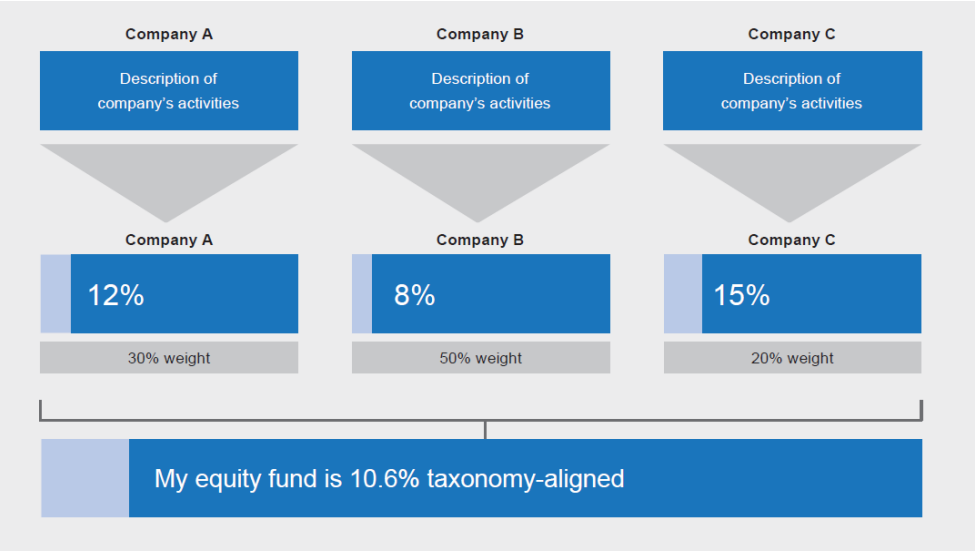
[21] Financial products are defined in Regulation (EU) 2019/2088, Article 2, as: (a) a portfolio manager in accordance with point (6) of this Article; (b) an alternative investment fund (AIF); (c) an IBIP; (d) a pension product; (e) a pension scheme; (f) a UCITS; or (g) a PEPP.

[22] Directive 2014/95/EU of the European Parliament and of the Council of 22 October 2014 amending Directive 2013/34/EU as regards disclosure of non-financial and diversity information by certain large undertakings and groups Text with EEA relevance

- to what environmental objective(s) the investments contribute to; and
- the proportion of underlying investments that are taxonomy-aligned, expressed as a percentage of the investment, fund or portfolio. This disclosure should include details on the respective proportions of enabling and transition activities, as defined under the Regulation.

The Figure 1 provides a simplified explanation of how to apply the taxonomy to a portfolio of company investments, considering turnover as the proxy for equity exposure to taxonomy-aligned activities.

Figure 1: Explanation of how to apply the taxonomy to an equity portfolio. Source: TEG report



In the case of large companies who are already required to provide a non-financial statement under the NFRD, their non-financial statement must include information on taxonomy-alignment. The NFRD covers, at a minimum, large public-interest companies with more than 500 employees, including listed companies as well as listed and non-listed banks and insurance companies. All companies subject to this requirement will include a description of how and to what extent their activities are associated with taxonomy-aligned activities. For non-financial companies, the disclosure must include:

- the proportion of turnover aligned with the taxonomy; and
- the proportion of CAPEX and, if relevant, OPEX related to taxonomy-aligned activities.

This disclosure should be made as part of the non-financial statement, which may be located in annual reporting or in a dedicated sustainability report.

Article 8 of the Taxonomy Regulation mandated the Commission to develop a Delegated Act by June 2021 at the latest to specify the content and presentation of the information to be disclosed, including the methodology to be used.

B.2.4 Expected impact

The EU taxonomy aims to increase investments in environmentally sustainable activities. These activities will contribute to lowering the overall environmental footprint and build the path towards achieving the EU environmental ambition.

The taxonomy will help companies to access finance more easily and possibly on more favourable terms if they either already carry out environmentally sustainable activities or seek to increase their share in environmentally sustainable activities by improving their activities' environmental performance in a credible way. This will make it easier for companies carrying out or investing in environmentally sustainable activities to raise debt and equity capital.

For investors, the taxonomy will help to identify investees that are aligned with the EU's long-term objectives (and/or those in the process of aligning), thereby potentially reducing transition risk exposure.

The EU taxonomy will also facilitate the development of EU-wide standards for environmentally sustainable financial products and the establishment of labels that recognise compliance with these standards. Notably, the potential EU Green Bond Standard (EU GBS) and the upcoming EU Ecolabel for financial products are set to use the EU taxonomy to define a pool of eligible environmentally sustainable activities in which investment (or a certain percentage of investment) will be mandatory to comply with the Standard or obtain the label.

In addition, the taxonomy may be used in further EU initiatives, including by the public sector. For example, the Resilience and Recovery Facility (RRF), aimed to drive the post-COVID recovery, made reference the 'Do No Significant Harm' principle in the Taxonomy Regulation as a principle that all measures included in the Resilience and Recovery Plans (RRPs) need to respect.

B.3 The TEG report on an EU taxonomy for the two climate-related objectives

The Technical Expert Group (TEG) on sustainable finance was formed by 35 members from civil society, academia, business, and the finance sector, as well as ten additional members and observers from EU- and international public bodies. It was mandated by the European Commission, *inter alia*, to develop technical screening criteria regarding activities that can make a substantial contribution to the climate change mitigation and adaptation objectives while avoiding significant harm to the other objectives defined for the EU Taxonomy.

The TEG produced a first report on the EU taxonomy in June 2019. Following a call for feedback on its content, some changes and improvements were implemented in order to make the recommendation more robust and usable. The TEG published its final report on the EU taxonomy in March 2020.

B.3.1 Sectors and activities covered

The TEG compared the direct greenhouse gas emissions of the 21 macro-sectors of the NACE nomenclature to prioritize the largest direct emitters. It selected the macro-sectors responsible for 93.5% of the direct GHG emissions and added some sectors based on their potential to enable climate change mitigation. The TEG mainly selected the same sectors for the climate change adaptation taxonomy, as uniform, qualitative criteria were proposed for climate change adaptation, and the DNSH criteria were already developed.

The TEG proposed 70 activities for the climate change mitigation objective and 68 generic activities for the climate change adaptation objective, across nine macro-sectors: agriculture and forestry; manufacturing; energy; water, sewerage, waste and remediation; transport; information and communication technologies (ICT); buildings: insurance services; engineering services.

B.3.2 Defining substantial contribution to climate change mitigation

Building on Article 10 of the Taxonomy Regulation, the TEG proposed the following types of activities that have the potential to make a substantial contribution:

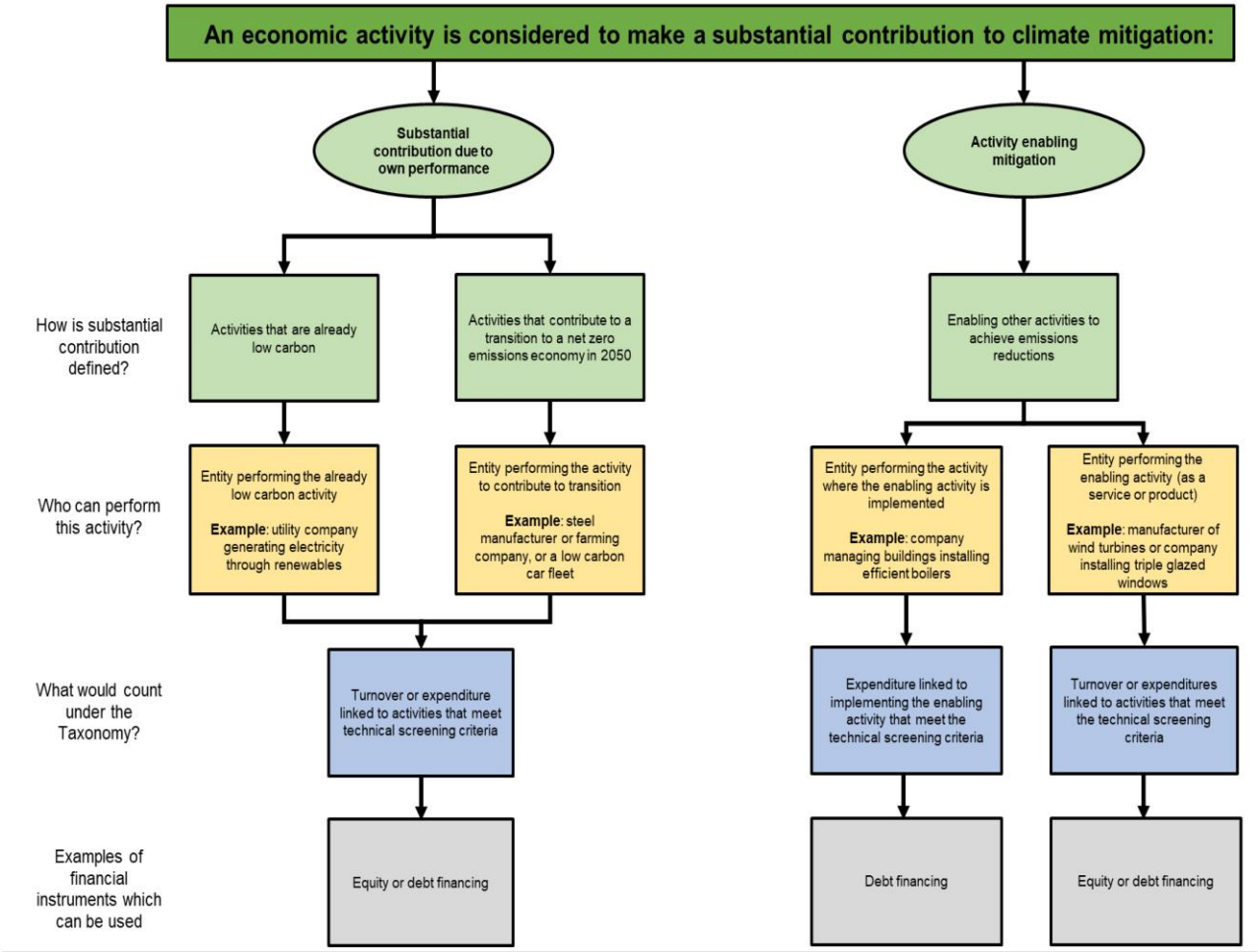
The activities that can make a substantial contribution due to their own performance, distinguishing two different types of activities:

- Activities that are already low carbon[23] (e.g. 'Production of Electricity from Wind Power')
- Activities that contribute to a transition to a net zero GHG emissions economy in 2050 (i.e., for an activity with high GHG emissions (e.g. 'manufacture of iron and steel'), specific activities that have substantially lower emissions than their peers)

Those activities that can make a substantial contribution by enabling other activities to make a substantial contribution to climate change mitigation:

- Activities that enable other activities to achieve GHG emissions reductions (e.g., 'Manufacture of low carbon technologies')

Figure 2: Defining substantial contribution for climate change mitigation. Source: TEG report



Technical screening criteria for the activities were set on the basis of technical work by experts drawing from EU regulation, technical publications, input from the European Commission services and dialogue with additional experts.

[23] Referred as 'Activities associated with sequestration or very low and zero emissions' in the TEG report https://ec.europa.eu/info/sites/default/files/business_economy_euro/banking_and_finance/documents/200309-sustainable-finance-teg-final-report-taxonomy_en.pdf

B.3.3 Defining substantial contribution to climate change adaptation

For the climate change adaptation objective, the TEG developed *process-based* technical screening criteria that are applicable to any economic activity. The TEG proposed two sets of technical screening criteria: those for *adapted* activities and those for activities *enabling* adaptation.

- Adapted activities contribute to the adaptation objective via adopting adaptation solutions that ensure that the activities can perform well under a changing climate. This contribution to adaptation usually occurs in activities that have a primary objective other than climate change adaptation. They include criteria for reducing material physical climate risks[24] (A1), supporting system adaptation (A2) and monitoring adaptation results (A3).
- Activities enabling adaptation contribute via supporting/developing adaptation solutions. Those activities are performed by entities developing or performing the enabling activity as a service or product. The criteria ensure supporting adaptation of other activities (B1).

B.4 The next steps for the taxonomy development

The European Commission adopted the Delegated Act for activities making a substantial contribution to the climate objectives in June 2021. The Commission used the TEG recommendations from the March 2020 TEG report[25] as a basis.

As per Art. 20 of the Taxonomy Regulation and to support the entire development and ongoing updates of the taxonomy, the European Commission established the Platform on Sustainable Finance (or 'Platform'), which started operating in October 2020. It is, inter alia, advising the Commission on technical screening criteria, including for the other four objectives set in the Taxonomy Regulation.

The European Commission will develop and adopt the Delegated Act for activities making a substantial contribution to the other four objectives in 2022, building on the future recommendations of the Platform. This Delegated Act may also include updates and additions for activities relevant to the climate change mitigation and adaptation objectives.

B.5 The 'Taxo4' project – Overview and objectives

In order to prepare the work to be carried out with the Platform on Sustainable Finance, the European Commission's Joint Research Centre (JRC) was tasked to perform a **preliminary analysis of methodologies and options for developing criteria for substantial contribution to each of the four remaining objectives** (hence the name 'Taxo4'). These four objectives are also termed 'objectives 3 to 6' and cover the following:

3. the sustainable use and protection of water and marine resources;
4. the transition to a circular economy;
5. pollution prevention and control;
6. the protection and restoration of biodiversity and ecosystems.

The analysis was provided as **technical input from the European Commission to the Platform on Sustainable Finance** to help it develop its recommendations on specific technical screening criteria for activities substantially contributing to the objectives 3 to 6. The Platform on Sustainable Finance's recommendations will help the European Commission in preparing this delegated act.

[24] https://www.ipcc.ch/site/assets/uploads/2021/02/Risk-guidance-FINAL_15Feb2021.pdf
[25] https://ec.europa.eu/knowledge4policy/publication/sustainable-finance-teg-final-report-eu-taxonomy_en

The aims of the 'Taxo4' project are further described in Table 1. This report is the final outcome of such project.

Table 1: What is the Taxo4 project about

What the Taxo4 project is about	**What the Taxo4 project is *not* about**
▸ Identify potential *approaches* to define substantial contribution ▸ Identify types of *Substantial Contribution* ▸ Provide guidance to set the *level of ambition* ▸ Discuss relevance, pros and cons of each approach ▸ Set a possible *methodology* to define criteria for an activity ▸ Advise and bring inputs to the Platform on Sustainable Finance	▸ Decide which activities should be covered ▸ Decide which approaches should be taken ▸ Decide the level of ambition ▸ Dictate choices to the Platform ▸ Deal with DNSH aspects

C. Conceptual framework

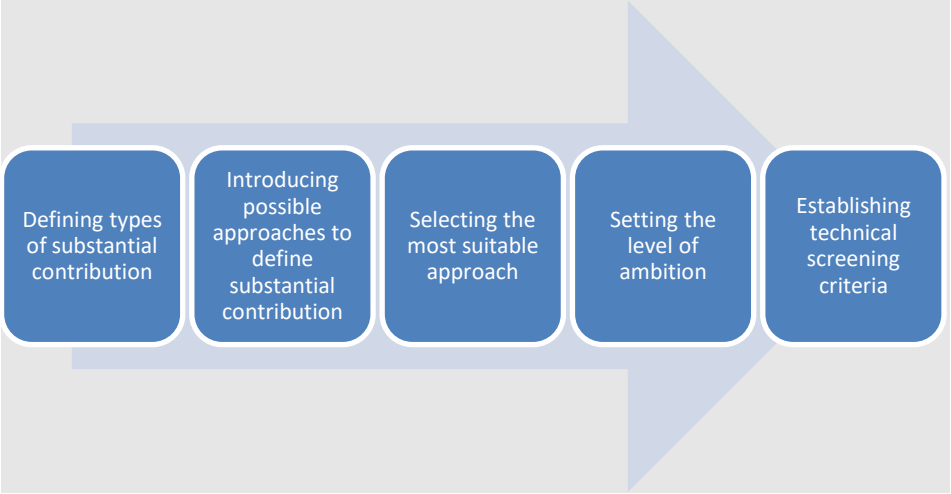
Purpose of the conceptual framework section

This section introduces and explains a framework to assess under which conditions an economic activity makes a substantial contribution to an environmental objective, including a methodology to establish robust, scientific, and evidence-based technical screening criteria*[26]. Therefore, this section presents the methodological steps and guidance proposed to develop the criteria for any of the four remaining environmental objectives, which are further analysed and specified in sections D, E, F, and G.

C.1 User guide

This user guide introduces the logical flow represented in Figure 3 and is explained in further details in the rest of this chapter.

Figure 3: Logical flow of the conceptual framework



Defining types of substantial contribution – Section C.2

For an activity to count as taxonomy-aligned, the essential requirement of substantially contributing to at least one environmental objective needs to be fulfilled. It is proposed that, an activity can achieve a substantial contribution to an environmental objective in three different ways: reducing pressure on the environment, directly improving the state of the environment, or directly enabling other activities. These substantial contribution types are explained in Section C.2 and further elaborated regarding the different environmental objectives in the subsequent sections D, E, F, and G.

Introducing possible approaches to define substantial contribution – Section C.3

Different approaches* can be used to assess the contribution of an economic activity: quantitative or qualitative, pressures or impacts (i.e., taking into account the context of activity), etc. For example, a practice-based approach would define a set of practices that an activity has to implement to be taxonomy-aligned.

[26] Terms followed by an asterisk are defined in the glossary at the end of the report

Building on the JRC report defining substantial contribution to climate change mitigation[27] and the criteria included in the final TEG report on EU taxonomy, **seven generic approaches** to assess the contribution of an activity and to establish the required level as criteria are proposed.

Selecting the most suitable approach – Section C.4

Section C.4 outlines a series of considerations that are **cross-cutting to all environmental objectives**, regardless of the sector and substantial contribution type. These considerations help to ensure alignment with the requirements defined in Article 19 of the Taxonomy Regulation. A more systematic screening methodology to select the most suitable approach is developed in the JRC Paper defining substantial contribution to climate change mitigation[28].

Setting the level of ambition – Section C.5

The Taxonomy Regulation sets out that technical screening criteria define what level of contribution should be considered as *substantial* for each economic activity. Section C.5 elaborates on how the available reference points (i.e. EU policies and scientific literature) can **provide guidance in setting the level of ambition*** while ensuring robust and usable criteria.

Putting the elements together - Establishing Technical Screening Criteria – Section C.6

But how do we actually establish criteria? This section explains how the different elements described in the previous sections can be combined **to establish a step-by-step methodology for setting technical screening criteria.**

C.2 Defining types of substantial contribution

Economic activities may exert **pressure** on the environment, such as emissions of pollutants or resource extraction. As a consequence, the **state of the environment** changes, such as the provision of adequate conditions for health, resource availability and biodiversity. This leads to **impacts** on human health, ecosystems and materials.

An activity can substantially contribute to an environmental objective in various ways, in this report referred to as '**substantial contribution types**' (or 'SC types') In sections D to G, a number of SC types are identified for each environmental objective (e.g., for the water objective: reducing water abstraction, reducing the emission of pollutants to water, restoration of water bodies, etc.).

These 'SC types' share similarities across objectives* and **three main ways** in which an activity can **make a substantial contribution to an environmental objective** were identified. It is nevertheless worth noting that these types of substantial contribution vary in their applicability to the different environmental objectives. As detailed in Articles 10 to 16 of the Taxonomy Regulation,

[27] Canfora et al, 2021 Substantial contribution to climate change mitigation – a framework to define technical screening criteria for the EU taxonomy, https://publications.jrc.ec.europa.eu/repository/handle/JRC123355?mode=full
[28] Canfora et al, 2021 Substantial contribution to climate change mitigation – a framework to define technical screening criteria for the EU taxonomy, https://publications.jrc.ec.europa.eu/repository/handle/JRC123355?mode=full

an economic activity can make a substantial contribution by meeting a defined level of ambition for an environmental objective through:

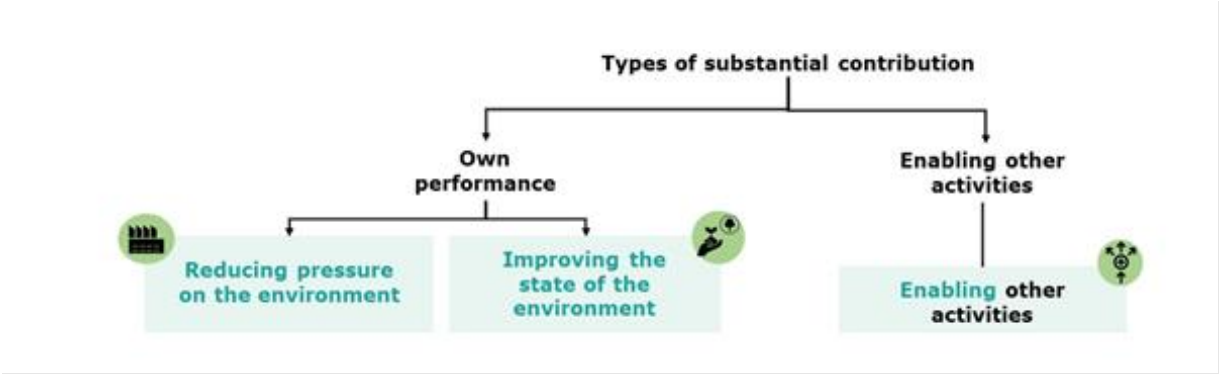
(1) ***reducing pressure*** *on the environment,*

(2) directly ***improving the state*** *of the environment (activities '****healing the environment****'), or*

(3) ***directly enabling*** *either of the two previous types.*

The term '**own performance** activities' is used to indicate collectively the first two classes above, because such activities are considered to make a substantial contribution by how they are performed, while the third class is about **enabling** other activities to make a substantial contribution. This classification is illustrated in the.

Figure 4: Types of activities and types of substantial contribution



Activities reducing the pressure on the environment

The **reduction of the pressures on the environment** must take place in relation to a baseline* (i.e. the likely alternative scenario). In other words, the activity may have a negative environmental impact* (by worsening the state of the environment) compared to no activity taking place. However, this negative impact is much smaller than that of the activities that would likely take place if the activity assessed was not carried out. By **substituting activities which exert higher environmental pressures**, the activity leads overall to a substantial reduction of environmental pressures. We can distinguish the following cases:

- Economic activities that generally are responsible for a significant pressure on the environment vis-à-vis the relevant environmental objective, but with **high improvement potential.** They make a substantial contribution if performed in a way that reduces the pressure on the environment compared to the baseline* (i.e., the likely alternative scenario). The undertaking of the activity compared to a no activity taking place scenario would be a negative impact on the environment. However, the impact will be significantly lower compared to the activity that would likely be carried out instead. As a result, by substituting activities exerting higher environmental pressures there is a **substantial reduction of the environmental pressure**. The technical screening criteria that define substantial contribution must restrict alignment only to activities carried out in such a way that results in substantial reductions of pressures. The Taxonomy Regulation refers to 'transitional activities'[29] for climate change mitigation. For instance, cement manufacturing activities are

[29] Art 10.2: 'An economic activity for which there is no technologically and economically feasible low carbon alternative shall qualify as contributing substantially to climate change mitigation where it supports the transition to a climate-neutral economy consistent with a pathway to limit the temperature increase to 1,5ºC above pre- industrial levels, including by phasing out greenhouse gas emissions, in particular emissions from solid fossil fuels, and where that activity: (a) has greenhouse gas emission levels that correspond to the best performance in the sector or industry; (b) does not hamper the development and deployment of low-carbon alternatives; and (c) does not lead to a lock-in of carbon-intensive assets, considering the economic lifetime of those assets.'

associated with high levels of GHG emissions, but such pressure can be reduced substantially by switching to alternative fuels, reducing the clinker to cement ratio, improving energy efficiency, etc. until reaching the requirement of the technical screening criteria.

- Activities that have a low **environmental impact** and are **helping to substantially reduce the pressure that other activities are exerting on the environment**. The environmental benefits achieved from reducing the environmental impact of other activities must substantially outweigh the impact the activities exert themselves on the environment.
- Activities that have a **low environmental impact** and have the potential to **substitute high impact activities**, therefore, significantly reducing the overall pressure that is exerted on the environment. This needs to be justified on a life cycle consideration basis. A substantial contribution in this context is not possible by shifting the environmental burden to another life cycle stage. While many activities across the economy have a low environmental impact (education for example), not all of them replace high impact activities.

Examples of economic activities:

- SC to *climate change mitigation*: an activity generating electricity from wind (a wind farm). If assessed over the whole life cycle, the activity is responsible for GHG emissions (from manufacturing the components, constructing the wind farm, doing the maintenance…). However, these emissions are much lower than those from generating the same amount of electricity from fossil fuel combustion.
- SC to *the sustainable use and protection of water and marine resources*: urban wastewater treatment is an activity that substantially reduces the impact of activities discharging wastewater by removing pollutants from the wastewater effluent before it is further discharged back into the environment.
- SC to *pollution, prevention and control*: electric vehicles which can substitute internal combustion engines vehicles.

Further considerations on activities reducing the pressures on the environment
Reducing the pressure is **relative** to a baseline. An activity is considered to reduce environmental pressures only if other activities with higher environmental pressure are likely to take place instead. As such, a comparison between the assessed activity and the activities it is likely to substitute can inform on the capacity to substantially contribute. Hence, an activity that cannot substitute a higher pressure activity will not be considered to make a substantial contribution. For example, a radio broadcasting activity is not considered to make a substantial contribution to transition to a circular economy because, despite low pressure on the environment, it is unlikely to substitute a higher pressure activity.
Note that an activity substituting activities associated with higher pressure will not be automatically deemed to make a substantial contribution: this depends on the **level of ambition** set.
Note that an activity that reduces the pressure exerted on the environment compared to the baseline does not necessarily substitute a *similar* activity: it may be a very different activity from another macro-sector which however is able to replace the likely alternative scenario: for instance, activities deploying IT infrastructures or developing videoconference software may foster teleworking and substitute car transport, hence reduce the overall pressure by comparison.
To effectively reduce the overall pressure on the environment, an activity should effectively substitute an activity with higher environmental pressure (and not just likely replace it). However, for usability issues, in some cases, it may be impossible to demonstrate effective substitution (for instance a PV solar operator would have to demonstrate that his activity is directly responsible for

the lower production or closure of a fossil fuel plant, which would be very burdensome to prove). Furthermore, this might otherwise lead to unlevel playing field issues (e.g. a company owning both renewable energy generation assets and fossil fuel plants may prove the substitution more easily than a company only owning renewable assets).

Activities directly improving the state of the environment

This SC type implies that the economic activity leads to a direct improvement in the state of the environment, i.e. healing the environment. In the case of climate change mitigation, this SC type included activities that remove carbon from the atmosphere and that therefore have the potential to reduce GHG concentration without having a net impact on the environment (e.g. afforestation, direct air capture).

Examples of economic activities:

- SC to *climate change mitigation*: an afforestation activity that leads to a long-term carbon sequestration. This results in an uptake of GHG emissions from the environment and thus an improvement in the state of the environment.
- SC to *biodiversity & ecosystems*: an activity restoring a wetland. The ecosystem's state improves (compared to the state before the restoration activity).
- SC to *water*: an activity restoring a river by removing concrete banks, remeandering it, and reinstating natural processes. Again, the state of the environment improves.[30]

Enabling activities

This SC type includes activities that **directly enable** other activities to make a substantial contribution. In line with Article 16 of the Taxonomy Regulation, these activities must not lead to lock-in in assets that undermine long-term environmental goals and their environmental impact must be positive over the life cycle (i.e. the benefit that is enabled must be larger than the impact of the enabling activity). In order to ensure that such requirements are generally fulfilled, enabling activities are usually defined at a quite granular level and are typically activities with a low direct impact.

Examples of economic activities:

- SC to *climate change mitigation*: the manufacture of components essential to the production of electricity from renewable sources (e.g., wind turbine). It makes the enabled activity (electricity generation from wind power) possible.
- SC to *pollution*: an activity consisting of manufacturing of end-of-pipe emissions abatement solutions, e.g. scrubbers to get rid of air pollutants from exhausts of a process. The scrubber manufacture process will have an impact on the environment, but overall, the use of the scrubber will result in more significant benefits for the environment, as it enables other activities to substantially reduce their pressure (providing that scrubber waste is appropriately managed).

Reminder: this section and this report only cover the Substantial Contribution, and not the Do Not Significant Harm side. For an activity to be eligible, substantially contributing to one objective is *not* enough, and compliance with criteria limiting the life-cycle negative impacts the activity may have on other objectives remains compulsory.

[30] Nota; these two illustrations (on biodiversity and water objectives) also highlight the overlaps between different connected objectives, with activities able to contribute to both. More on that topic in section H.

C.3 Introducing possible approaches to define substantial contribution

One of the four basic requirements stated in the Taxonomy Regulation for an economic activity to count as environmentally sustainable is making a substantial contribution to at least one of the six environmental objectives. However, the Taxonomy Regulation itself does not define what counts as a substantial contribution, nor does it specify how to define it. This appears to leave a lot of flexibility to the delegated acts as they include the technical screening that determine substantial contribution for each activity and specific environmental objective. Nevertheless, the requirements of Article 19 of the Taxonomy Regulation provide boundaries to this flexibility. A robust framework around the choice of approaches is needed in order to fulfil these requirements.

In this report, the term **'approach'** refers to one of the ways to set **criteria**. The approach covers the way in which (1) the environmental performance of an activity is **measured or assessed** (e.g., quantitative vs. qualitative, units used) and (2) how the required level of environmental performance can be **defined** (e.g., implementation of certain practices, baseline or comparison group).

Several approaches to defining EU taxonomy criteria can be derived from the work performed by the TEG. These approaches have been used to define substantial contribution criteria to climate change mitigation and adaptation and to set the DNSH criteria. The further development of this conceptual framework has led to the identification of seven 'generic' approaches. They have intrinsic strengths and weaknesses presented below, notably with regards to the requirements set by the Taxonomy Regulation. However, **the choice of one approach over the others mostly depends on the environmental objective and the activity or sector covered**: the nature of the activity, the availability of data, etc., which are key in the selection of the most suitable approach.

An overview of the seven generic approaches defined in the JRC paper on substantial contribution to climate change mitigation [31] is provided. As these have already been encountered and studied in previous work, they are also considered useful for the current work.

Note that other approaches might be elaborated when developing the EU taxonomy for the four objectives (or extending the EU taxonomy to new climate change mitigation and adaptation activities), as the Taxonomy Regulation is not prescriptive in this regard.

The seven generic approaches developed are the following (see examples in the **Table 2**):

1. **Impact-based approach**: Criteria that are set within this approach require a certain level of *impact* of the activity on the environmental objective considered. The impact of an activity depends on the *pressures* that the activity exerts (e.g., water abstraction, GHG emissions) but also on the *context* in which an activity takes place (e.g. water availability in the area where the activity is located). Activities qualify if they operate above or below a given threshold.
2. **Performance in relation to the environmental target**: Criteria that are set within this approach require a certain level of performance defined in terms of the *pressure* that the activity exerts on the environment (e.g. GHG emissions, water abstraction, etc.). This pressure is measured with a specific performance metric (direct or proxy) relating to the environmental objective considered. Activities qualify if they achieve a certain level of performance derived from environmental considerations (EU policy, scientific literature). This performance-based approach is independent of the context where the activity takes place and only relies on the *intrinsic* performance of the activity.

[31] Substantial contribution to climate change mitigation – a framework to define technical screening criteria for the EU taxonomy, forthcoming Canfora et al, 2021 https://publications.jrc.ec.europa.eu/repository/handle/JRC123355?mode=full

3. **Best-in-class performance:** Like for the previous approach, the criteria require a certain level of performance of the activity, defined as a pressure, and measured under the relevant metric. Activities qualify if they operate above a threshold based on the performance currently achieved by best performers (e.g. the threshold can be the average level of performance achieved by the top 10% best activity operators in the EU).
4. **Relative improvement:** In this approach, the criteria require a minimum evolution of a metric over time. This can be the performance improvement of an underlying activity or asset (e.g. improving the energy performance of a building for a renovation activity), the improvement of the state of the environment (e.g. reducing the amount of water pollutants by X% for a cleaning activity), etc. Activities qualify if they are responsible for an improvement by at least a defined relative threshold, for instance, an energy efficiency improvement of at least 20% compared to a previous point in time.
5. **Practice-based:** This qualitative approach relies on a set of precise practices reducing the pressure or improving the state of the environment. These practices describe *how* the activity must be performed. Activities qualify if they adopt those practices. An example could be the implementation of sustainable farming practices.
6. **Process-based:** The criteria define a number of qualitative process-based steps to determine how to reduce the pressure or enhance the status of the environment. Activities qualify if they follow those steps and implementing the actions resulting from following them.
7. **Nature of the activity:** The criteria define the exact scope and description of the activity. Activities qualify if they fall within this scope/description independent of their performance. Such activities are then automatically eligible[32] without any quantitative or qualitative requirements. These criteria can be used for a whole generic activity (e.g. all activities from 'production of electricity from Solar PV' are automatically eligible) or for a part only (e.g. use of electric cars automatically eligible within the activity 'transport of passengers by cars').

[32] provided that the DNSH and minimum safeguards are met.

Table 2: Presentation of the generic approaches

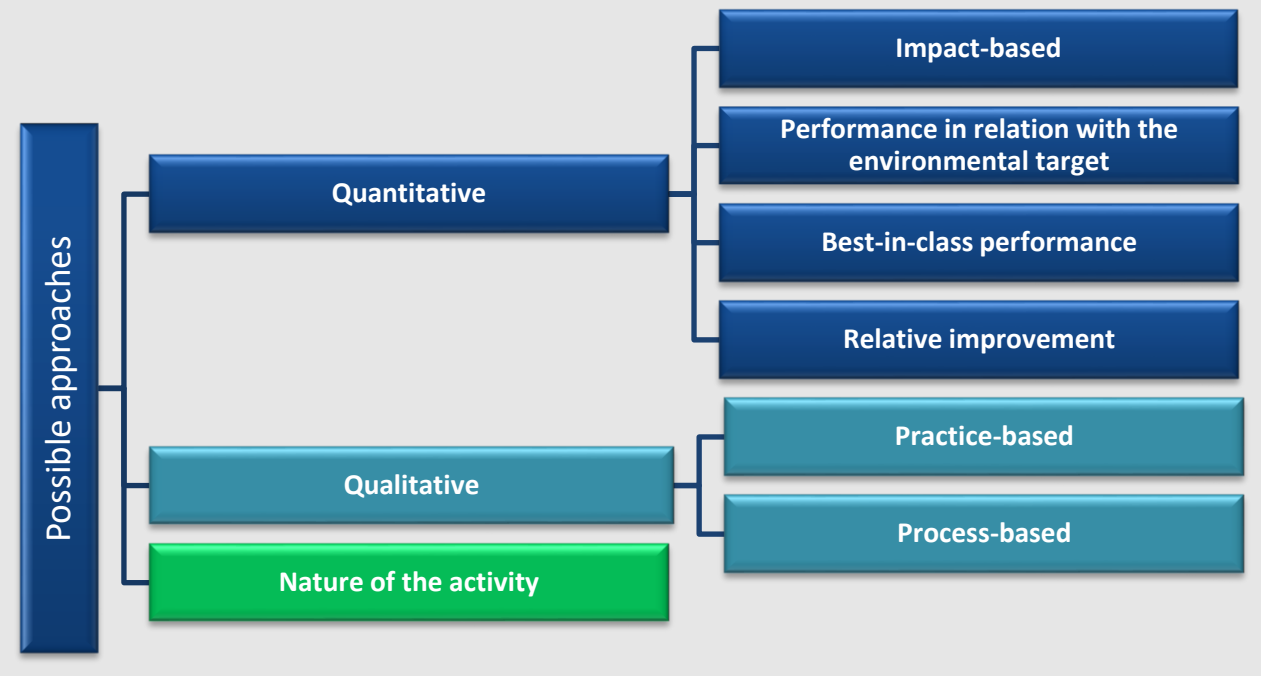
Approach	Quantitative / Qualitative	The technical screening criteria define…	Examples[33]
(1) Impact-based	Quantitative	… minimum requirements for the impact (effect) on the environment of carrying out the economic activity (e.g. absolute GHG emissions savings considering the emissions from the activity and the avoided emissions from the activity it replaces, if any)	The TEG suggests that the manufacture of low carbon technologies and their key components that result in substantial GHG emission reductions in other sectors of the economy is eligible if they demonstrate substantial higher net GHG emission reductions compared to the best performing alternative technology/ product/ solution available on the market on the basis of a recognised/standardised cradle-to-cradle carbon footprint assessment (e.g. ISO 14067, 14040, EPD or PEF) validated by a third party.
(2) Performance in relation to the environmental target	Quantitative	… minimum threshold (derived from the likely pressure on the environment of carrying out the economic activity) for the environmental performance of the activity (e.g. a level of GHG emissions per unit of activity that is considered aligned with a climate neutral economy)	The TEG suggests that light commercial vehicles with tailpipe emission intensity of max 50 g CO_2/km (WLTP) are eligible.
(3) Best-in-class performance	Quantitative	… minimum threshold (derived from the top market players performance) for the environmental performance of the activity (e.g. a level of GHG emissions per unit of activity that only the best 10% markets players achieve)	The TEG suggests that the manufacturing of nitric acid is eligible if the GHG emissions (calculated according to the methodology used for EU-ETS benchmarks) associated to the production processes are lower than the values of the related EU-ETS benchmarks. As of February 2020, ETS benchmark: 0.302 tCO_2e/t of nitric acid
(4) Relative improvement	Quantitative	… minimum improvement threshold for the environmental performance of the activity (e.g. a level of reduction of GHG emissions per unit of activity that is considered aligned with a climate neutral economy pathway)	The TEG suggests that the building renovation is eligible if it leads to reduction of Primary Energy Demand of at least 30% in comparison to the energy performance of the building before the renovation.
(5) Practice-based criteria	Qualitative	… a set of practices (derived from widely accepted best practices on the market) for the economic activity (e.g. compliance with a set of qualitative criteria, with a code of conduct, certification by an EU scheme, etc.)	The data centre implements the European Code of Conduct for Data Centre Energy Efficiency. This implies implementation of the practices - including relevant optional ones where reasonable - described in the most recent 'Best Practice Guidelines for the European Code of Conduct for Data Centre Energy Efficiency' (JRC) or in CEN/CENELEC documents CLC TR50600-99-1 and CLC TR50600-99-2.
(6) Process-based	Qualitative	… a set of process-based steps (e.g. a set of actions or points of focus that need to be addressed)	TEG suggests that within the sector 'anaerobic digestion of bio-waste', an activity makes a SC to climate change mitigation if a leakage monitoring plan is in place.

[33] Please note that this table was prepared before work on the EU Taxonomy delegated act on the climate change objectives. The examples presented in this table come from the March 2020 TEG report with some modifications. They are only for illustration purpose of the different approaches.

(7) Nature of the activity criteria	Qualitative	… the description of the activity automatically eligible (derived from proven substantial contribution of that activity) (e.g. an activity that would always respect the absolute performance threshold and hence doesn't need verification every time, s.a. EV or wind energy)	TEG suggests that zero tailpipe emission vehicles (incl. hydrogen, fuel cell, electric) are automatically eligible. Manufacture of secondary aluminium is eligible. No additional mitigation criteria need to be met.

These seven generic approaches are divided into three major classes, depending on how the criteria are measured, as it is shown in Figure 5:

Figure 5: Types of possible approaches



C.4 Selecting the most suitable approach

The Taxonomy Regulation (Art. 19) defines a number of conditions that need to be complied with in the setting of technical screening criteria. These can be summarised in the following four broad requirements:

- policy coherence: the approach allows to build on EU legislation, approaches and policy goals;
- environmental ambition and integrity: the approach allows to follow scientific evidence and take into account life cycle considerations;
- level playing field: the approach allows fair treatment of activities within the same sector;
- usability of the criteria: the approach allows to develop criteria that are of easy and unambiguous implementation and verification.

Although **the degree of compliance of each approach with each requirement depends on the environmental objective**, **on the type of substantial contribution and on the sector and activity considered**, we identify some findings that are valid across the board. The JRC publication 'Substantial contribution to climate change mitigation – a framework to define technical screening criteria for the EU taxonomy'[34] provides a systematic screening methodology to select the most suitable approach. In order to do so, for any individual economic activity, the alignment of each of the seven general approaches is evaluated against each of the four broad requirements defined in Article 19 of the Taxonomy Regulation. The publication contains inter alia a table with the a priori alignment of each approach with each requirement (independently of the activity), and a table with a list of specific points to consider evaluating each approach against each requirement.

It is recommended using such systemic screening methodology to select the most suitable approach. When that is not possible (e.g. because of the time available) at least the following three guiding considerations should be followed.

1. Prefer quantitative approaches over qualitative ones

Article 19 of the Taxonomy Regulation dictates that the Technical Screening Criteria shall **'be quantitative and contain thresholds to the extent possible, and otherwise be qualitative'.** The first step is to identify for the activity assessed whether there are quantitative indicators that are usable and relevant. Supposing this is the case, quantitative approaches are to be preferred. Only if there is no relevant or usable quantitative indicator may one opt for a qualitative approach (i.e. practice and process-based approaches).

2. Check for major misalignment with the four broad requirements

In particular, **the level playing field requirement can prove challenging to meet for the relative improvement approach or for some context-specific activities**. The best-in-class approach can also contradict with the environmental integrity and policy coherence when setting a criteria too stringent for activities with low to no impacts on the environment. Keeping in mind the different dimensions of the requirements in Article 19 while setting the criteria may help to deal with potential trade-offs in a transparent and accountable manner and help to justify why priority is given in a certain case to one requirement over another.

[34] Canfora et al, 2021, Substantial contribution to climate change mitigation – a framework to define technical screening criteria for the EU taxonomy, https://publications.jrc.ec.europa.eu/repository/handle/JRC123355?mode=full

3. A combination of approaches can be used

One approach may not be enough to cover the complexity of one activity. For that reason, the selection and combination of several approaches can lead to the formulation of more robust criteria. For example, for a certain economic activity, a performance-based approach and a practice-based approach could be both suitable (for instance, in the TEG's work for climate change mitigation, plastics manufacturing can be considered taxonomy aligned either if the plastic produced comes from mechanical recycling or if the carbon intensity of the plastic manufactured is below a given threshold).

The **combination of approaches can also be context-specific**: the selection of one approach can be relevant under certain context-specific conditions, while another criterion based on another approach may be relevant in other situations. For instance, activities consuming water may have to meet different criteria (developed following a different approach) whether they are operated in water scarce or water abundant areas.

The approaches defined in Section C.3 are generic and have been identified based on the TEG's technical work, but they should not preclude the use of **other approaches that may be developed in the future**.

C.5 Setting the level of ambition

The **Taxonomy Regulation** defines the six environmental objectives and Articles 10 to 15 indicate the means by which an activity can make a substantial contribution to each of these objectives but, this **does not define precisely what should be considered substantial.** This element is a key aspect that needs to be defined, for each activity, by the Technical Screening Criteria in the delegated acts that the Taxonomy Regulation empowers the European Commission to adopt.

A number of considerations are reported below to guide the selection of the level of ambition* for the development of new criteria for activities:

1. EU policy and state-of-the-art science should be used as reference points

Article 19 of the Taxonomy Regulation explicitly requires the Technical Screening Criteria* to 'be based on conclusive scientific evidence' and to 'take into account any relevant existing Union legislation'. Hence EU policy and recognized state-of-the-art scientific work (e.g. work from IPCC, IPBES, EEA, etc.) should be used as key **reference points**: they can provide **targets**, **transition pathways, and desirable end-states** that can inform criteria setting.

2. The level of ambition needs to be coherent with the approach selected

The activity assessed influences both the approach and the level of ambition: for instance, if no quantitative indicator is relevant for the activities considered, the ambition level can't be specified in quantitative terms (e.g. by a threshold). Nevertheless, once a suitable approach is selected, there is still some margin left to establish the level of ambition: if a performance-based approach is chosen, the threshold defining the ambition level can still be more or less stringent. If a practice-based approach is selected, a choice to define the level of ambition may still be possible, between several more or less stringent sets of practices.

3. Reference points / targets need to be translated into requirements at economic activity level

Most EU environment-related policies set objectives and targets or, more broadly, levels of ambition for the overall state of the environment or **at Member State level** but, more rarely, at the **activity level** (e.g., Best Available Techniques (BATs) in the BREFs[35]). Also, the scientific evidence that could inform the setting of a level of ambition won't necessarily be available at the sectoral or activity level. The high-level scientific and policy reference points need to be converted into ambition level for the more granular economic activity level. This may require further investigation and assumptions that should be understood and recorded in the process.

4. Making a substantial contribution to an environmental objective is likely to go beyond legal compliance

In most cases, requirements in EU legislation that are at the activity level need to be met by all entities targeted. Hence, in most cases, compliance of an activity with these requirements is not sufficient to make a substantial contribution (but they can serve as a basis to elaborate targets, e.g., by establishing relative exceedance of the compliance level). However, EU legislation that imposes targets and requirements at the MS level can, in some cases, provide a reference point to set the level of ambition for substantial contribution by individual economic activities that would not be directly obliged to meet those targets or requirements.

5. The level of ambition set should be assessed against current and expected environmental performance in the market in future

The definition of the level of ambition should consider the **level of performance of the market**, both current and projected**.** An insubstantial level of ambition may lead to accepting medium-to-poor performers and the risk of greenwashing. While a level of ambition that is too stringent can be unreachable for market participants or lead to a niche market that does not leverage enough investments and environmental improvement.

6. Consider the overall balance of the taxonomy's level of ambition among environmental objectives

Notwithstanding the numerous overlaps, the six environmental objectives may require different levels of ambition to define substantial contribution. It is therefore important **to be aware of the potential discrepancies in stringency**. Indeed, if it is easier to prove substantial contribution to one objective rather than another, it is likely that the market will focus on the most easily achievable criteria, leading to a risk of relative under-investment for the other objectives. The same discrepancy should also be taken into account for an economic activity contributing to several objectives (see section H).

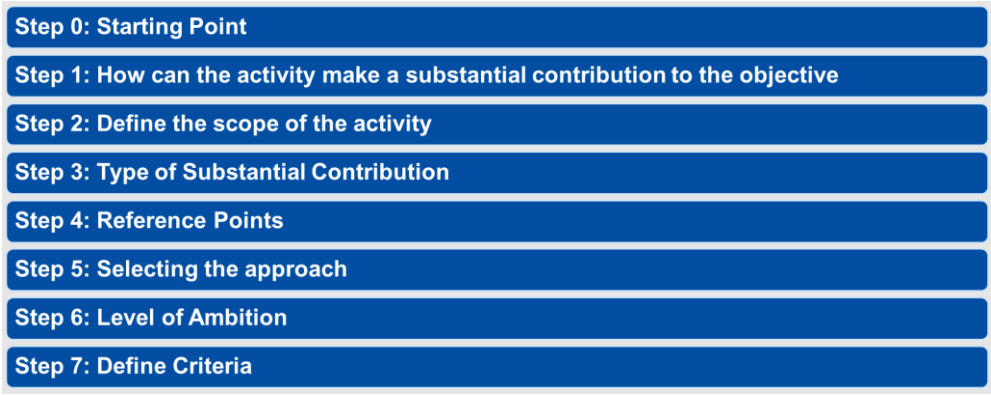
[35] BAT reference documents (BREFs) represent the outcome of the 'Sevilla process' and provide the operating conditions and emission rates for a range of the industrial activities listed in Annex 1 to the EU's IPPC Directive. https://eippcb.jrc.ec.europa.eu/reference/

C.6 Establishing technical screening criteria

The conceptual framework for setting technical screening criteria (TSC) presented in this chapter can be operationalised into a step-by-step methodology made of the seven steps presented in Figure 6.

While these steps are presented sequentially, in practice setting TSC requires following the methodological steps in an iterative form as through increased background knowledge and understanding of the economic activity, prior steps would most likely need to be revised.

Figure 6: Methodological steps for setting technical screening criteria



Additionally, please note that, in order to simplify the presentation of the methodology:

-This section only deals with defining SC, while in practice defining DNSH would occur in parallel

-The specificities of each environmental objective are not addressed (e.g., considering the adaptation objective not all the wording used in this context could be applied)

-The case when SC to more than one environmental objective is relevant and would be worked on in parallel is not specified

Step 0: Starting point

Step 0 describes the starting point for setting technical screening criteria. This consists at least of a name or NACE code of activity and environmental objective the activity would be considered for. This would typically be result of a prior prioritisation that is not addressed here.

Step 1: How can the activity make a substantial contribution to the objective

The aim of step 1 is to develop an understanding on how the activity can make a substantial contribution. The subsequent guiding questions can help to determine and map out the potential ways to make an SC.

1. How does the activity impact/ help the given environmental objective? Does the activity have the potential to reduce pressure on the environment, improve the status of the environment, or enable any of the two? How?

2. Which are the most relevant environmental hotspots or contributions to the given objective along its value-chain on the basis of life cycle considerations?

3. Can the activity be performed in a way that is low impact vis-à-vis the environmental impact of such hotspots?

4. If not, is there a low-impact replacement activity that the taxonomy could recognise instead?

5. Is there a key activity that enables such SC?

The guiding questions do not necessarily need to be answered individually. These only serve to give guidance on determining possible substantial contributions for a specific activity and environmental objective. However, Step 1 is a crucial assessment step to identify all possibly relevant economic activities at a more granular level as well as the potential ways of SC in broad terms to ensure that are properly considered in the following steps.

Step 2: Define the scope of the activity

Step 2 is about selecting the right level of granularity for the activity or activities considered, the right level of granularity is defined as the level at which homogeneous and consistent criteria are possible to be set. In general, a broader activity scope that would require different cases or approaches within the technical screening criteria is better to be avoided.

The scope of the activity is thus redefined, providing a clear description, according to the NACE classification, the NACE classification with additional specifications in the cases where NACE categories are not adequate (e.g., too broad or narrow) or an ad-hoc definition in cases where the activity is not referring to any NACE category.

Step 3: Type of substantial contribution

In Step 3, the relevant types of substantial contributions (SC) are determined for the analysed activity and environmental objective according to the SC type diagrams presented for the different environmental objectives. These types of SC are based on the specific environmental objective and presented and explained in sections D, E, F, and G of this report. These have been updated in line with legal analyses and discussion with the Platform on Sustainable Finance experts.

It is essential to record the rationale for the choice. This will be beneficial for setting the criteria in step 7.

Step 4: Reference points

In Step 4, two types of reference points are identified: forward-looking/ end-state reference points and state-of-the-art reference points. The identification and analysis of forward-looking/ end-state reference points (in EU policies, scientific reports, etc.) will be useful to set the level of ambition. Although, most EU environmental-related policies set objectives and targets or, more broadly, levels of ambition, for the overall state of the environment or at the national/regional level rather than at the activity level. Identifying these reference points is crucial to guide their translation to the specific activity analysed.

The identification of the state-of-the-art reference points on the other side will help define the elements that can and cannot be included in the taxonomy criteria as the taxonomy recognizes activities/ levels of performance that can be invested in and, thus, are commercially available (i.e., TRL above 8).

Some possibly relevant reference points for each environmental objective are given in the Annexes A.1, A.2, A.3 and A.4

Step 5: Selecting the approach

Step 5 is about selecting the most suitable approaches, as explained in sections C.3 and C.4. For selecting the most suitable approach, all relevant approaches identified are assessed against the requirements in Art 19 of the Taxonomy Regulation (section C.4). Guidance indicating which approaches are likely or unlikely to be suitable for the specific SC types identified for each environmental objective is provided in sections D, E, F and G.

Note that an approach cannot be selected without verifying that a relevant level of ambition can be defined accordingly (Step 6). Therefore, steps 5 and 6 need to be carried out in parallel.

Step 6: Level of ambition

Drawing from available reference points (Step 4) and considering the approach selected to set the technical screening (Step 5), in this step, the level of ambition for the specific activity is defined, following the guidance provided in section C.5.

Step 7: Define criteria

The technical screening criteria for substantial contribution for the specific activity can be defined bringing the outcomes from the previous steps together. The technical screening criteria need to strike the best balance between the different requirements in the Taxonomy regulation (Art. 19) and fulfilling the overall taxonomy aims.

The taxonomy criteria can and should be updated over time to adjust the level of ambition; at the same time, one needs to ensure that the required criteria for the specific activity and sector are investable in at present.

D. Sustainable use and protection of water and marine resources

The views regarding the substantial contribution types for sustainable use and protection of water and marine resources have developed significantly as work has progressed with the Platform on Sustainable Finance. As such, the types of substantial contribution described take into account the view of the Legal Service of the European Commission regarding Article 12 of the Taxonomy Regulation.

Introduction

Article 12 of the Taxonomy Regulation defines when an economic activity[36] has to be considered to contribute substantially to the sustainable use and protection of water and marine resources:

An economic activity shall qualify as contributing substantially to the sustainable use and protection of water and marine resources where that activity

- either contributes substantially
    - to achieving the good status of bodies of water, including bodies of surface water and groundwater or
    - to preventing the deterioration of bodies of water that already have good status,
- or contributes substantially
    - to achieving the good environmental status of marine waters or
    - to preventing the deterioration of marine waters that are already in good environmental status,

by:

(a) protecting the environment from the adverse effects of urban and industrial waste water discharges,

- including from contaminants of emerging concern such as pharmaceuticals and microplastics,
    - for example by ensuring the adequate collection, treatment and discharge of urban and industrial waste waters;

(b) protecting human health from the adverse impact of any contamination of water intended for human consumption by

- ensuring that it is free from any micro-organisms, parasites and substances that constitute a potential danger to human health
- as well as increasing people's access to clean drinking water;

(c) improving water management and efficiency, including

- by protecting and enhancing the status of aquatic ecosystems,
- by promoting the sustainable use of water through the long-term protection of available water resources, inter alia through measures such as water reuse,
- by ensuring the progressive reduction of pollutant emissions into surface water and groundwater,
- by contributing to mitigating the effects of floods and droughts, or
- through any other activity that protects or improves the qualitative and quantitative status of water

[36] Note: a glossary of key concepts can be found at the end of the report

(d) ensuring the sustainable use of marine ecosystem services or contributing to the good environmental status of marine waters,

- including by protecting, preserving or restoring the marine environment and
- by preventing or reducing inputs in the marine environment; or

(e) enabling any of the activities listed in points (a) to (d) of this paragraph in accordance with Article 16.

Article 2 of the Taxonomy Regulation defines '*marine waters'*, '*surface water'* '*groundwater'*, '*good environmental status'* and, 'and '*good status*'.

The following two closely related questions on the interpretation of Article 12 of the Taxonomy Regulation came up throughout the process of developing technical screening criteria (TSC):

1. Can an activity with pressures[37] on a water body that are much lower than the sector average qualifies as making a substantial contribution to the water objective?
2. Does this depend on the status of the water body affected by the activity?

Types of Substantial Contribution

Four types of substantial contribution were identified for an activity to substantially contribute to a sustainable use and protection of water and marine resources:

- **SC 1:** for activities with positive impact
- **SC 2**: for activities leading to an improvement in another activity
- **SC 3:** for activities dealing with pressures from other activities
- **SC 4**: for activities with pressures substantially lower than sector average

SC 1 – An activity with positive impact

Some activities have a direct **positive impact** on the environment. An example could be the restoration of wetlands helps to enhance their capacity to act as carbon sinks (i.e. once restored, these wetlands can better capture and store CO_2 from the atmosphere, thus reducing CO_2 concentrations in the atmosphere).

However, most activities exert some pressures on the environment, thus leading to a negative impact. To achieve our environmental objectives, *these pressures need to be minimised*[38]*.* That is the reason why, in addition to such activities with a direct positive impact, the taxonomy aims to recognise as 'green' (taxonomy-aligned) those **activities that significantly reduce pressures in line with meeting the EU's environmental policy objectives**.

[37] These would include pressures on surface waters such as impacts on ecological, chemical and hydro-morphological quality/status; as well as pressures on groundwater, such as impacts on chemical and quantitative quality/status.

[38] Such pressure minimisation can be incentivised by formulating appropriate substantial contribution criteria. At the same time, adding DNSH criteria to the water objective (as to other objectives) are another way to ensure pressures are reduced to an acceptable level (in line with Article 17) for those activities that are addressed through substantial contribution criteria to another environmental objective.

There are three cases, which are captured as part of SC 2, 3 and 4 below.

SC 2 – An activity leading to an improvement in another activity

It relates to an activity leading to an improvement in another activity by the improvement of measures, upgrades etc. An activity can make a substantial contribution by an *improving the environmental performance* of another activity. In many cases, such activities would qualify as an enabling activity in the meaning of Article 16 of the taxonomy Regulation. An example could be upgrading (activity B) an industrial installation discharging pollutants directly into a water body (activity X) leads to a reduction in the emission of pollutants[39].

SC 3 – An activity dealing with pressures from other activities

An activity can make a substantial contribution by capturing pressures from other activities and mitigating them. An example could be a plant treating wastewater from other installations in an industrial park and/or from households leading to a reduction in pollutants emitted to the water body.

SC 4 – An activity with pressures substantially lower than sector average

An activity which is responsible for some pressures can make a substantial contribution by having lower pressures than the average of other activities within the same sector. An example could be a steel manufacturing installation whose emissions of pollutants to water that are much lower than the average emissions of other steel manufacturing installations.

Recognising SC type 4 activity as reducing pressures would rely on an assumption for the counterfactual: if the activity had not taken place (e.g. wind power), another activity with higher pressures (e.g. in the worst case coal) would have taken place instead to respond to the demand for the output (e.g. electricity). While the construction of a new wind farm is not automatically accompanied by the closure of a coal plant (direct replacement), the idea is to encourage a gradual shift in electricity production (replacement from a system's and medium-term perspective).

Article 12.1 of the Taxonomy Regulation states that an activity makes a **substantial contribution to water** where that activity 'contributes substantially to achieving the good status of bodies of water, or to preventing the deterioration of bodies of water that already have good status […].'[40]

It is quite straightforward to argue that activities of type 1, 2 and 3 contribute to achieving the good status of water bodies, or to preventing the deterioration of water bodies already in good status[41]. However, there is a **question as to whether an activity of type 4** (with pressures much lower than sector average) **can be considered to make such a contribution**.

- **For an activity linked to a water body not in good status:**
    - When an activity of SC type 4 (with lower pressures) **does not directly replace** another activity with higher pressures on the same water body, it cannot be considered to be making a substantial contribution to achieving good status since the activity is responsible for new pressures (even if lower than sector average) on the affected water body.

[39] The upgrading could involve in an end-of-pipe solution (e.g. installing a system to treat the waste water) or in an integrated pollution abatement (e.g. the use of different types of chemicals)

[40] The article continues with an equivalent phrase relating to marine waters: 'or contributes substantially to achieving the good environmental status of marine waters or to preventing the deterioration of marine waters that are already in good environmental status'.

[41] Whether that contribution is substantial depends on whether the activity considered meets the relevant technical screening criteria.

- The assumption that the counterfactual would be another activity with higher pressures is not appropriate.
    - Indeed, an activity takes place in a specific water body, and the counterfactual may be an activity in another water body, with a different status.
    - As such, a comparison with the approach taken under the 1st DA for climate mitigation activities, where the counterfactual relied on a systemic perspective and indirect replacement of high-pressure activities was considered a way to demonstrate the substantial contribution to climate mitigation, is not appropriate.
- When an activity of SC type 4 **directly replaces** another activity with higher pressures on the same water body (i.e. simultaneous closure of the high-pressure activity), it can be considered to be making a substantial contribution to achieving good status through pressure reduction – providing the difference in pressure reduction is substantial.

- **For an activity linked to a water body having a good status**:

Even if there is no direct replacement, the activity can only be considered to contribute to *preventing deterioration of bodies of water that already have good status* if the pressure exerted by the activity is at a level that does not lead to the deterioration of that same status. Just having a pressure level lower than the sector average would not be sufficient. This follows from the drafting of the chapeau text of Article 12. The practical relevance of this case for the sectors teams may well be limited[42].

The following table provides an overview of these cases.

Table 3: Summary of cases for type 4 activities 'with pressures substantially lower than sector average'

	The water body does not have good status	***The water body has good status***
Activity directly replaces another activity with higher pressures on the same water body	Contributes to achieving good status[43] (subject to compliance with TSC)	Contributes to preventing deterioration (subject to compliance with TSC)
Activity does not directly replace another activity	*Does not* contribute to achieving good status	Contributes to preventing deterioration (subject to compliance with TSC and depending in particular on level of pressure exerted by the activity)

The above guidance rests on the legal interpretation that **activities with the same level of pressures can be treated differently based on the water body they affect (i.e. their location)**[44], as the situation of a body of water of good status is not comparable to the situation of a body of water of bad status. Therefore, the same activity may or may not qualify depending on the status of the relevant body of water.

[42] This is because such a situation may be unlikely to arise in practice, an possible example being a new industrial installation that is constructed according to state-of-the-art technology which avoids deterioration of the status of a water body already in good status.

[43] This could also cover cases of a water body in good *potential*, in view of bringing it to good *status*.

[44] The Commission's Legal Service confirmed this would be appropriate and would not violate Art. 19.1(j), which requires that criteria 'ensure that those activities are treated equally if they contribute equally towards the environmental objectives set out in Article 9 of this Regulation, to avoid distorting competition in the market'.

References points to set the level of ambition

Annex A.1 provides a listing of EU policies relative to Sustainable use and protection of water and marine resources. It also provides a list[45] of targets or points of reference that can be used as a guidance to set the level of ambition at the economic activity level (using also the considerations listed in section C.5).

[45] *Note that this list doesn't aim to be exhaustive.*

E. Transition to a circular economy

Introduction

Article 13 of the Taxonomy Regulation defines when an economic activity[46] has to be considered to contribute substantially to the Transition to a Circular Economy environmental objective:

An economic activity shall qualify as contributing substantially to the transition to a circular economy, including waste prevention, re-use and recycling, where that activity:

a. uses natural resources, including sustainably sourced bio-based and other raw materials, in production more efficiently, including by:
    1. reducing the use of primary raw materials or increasing the use of by-products and secondary raw materials, or
    2. resource and energy efficiency measures;

b. increases the durability, reparability, upgradability or reusability of products, in particular in designing and manufacturing activities;

c. increases the recyclability of products, including the recyclability of individual materials contained in those products, inter alia by substitution or reduced use of products and materials that are not recyclable, in particular in designing and manufacturing activities ;

d. substantially reduces the content of hazardous substances and substitutes substances of very high concern in materials and products throughout their life cycle, in line with the objectives set out in Union law, including by replacing such substances with safer alternatives and ensuring traceability;

e. prolongs the use of products, including through reuse, design for longevity, repurposing, disassembly, remanufacturing, upgrades and repair, and sharing products;

f. increases the use of secondary raw materials and their quality, including by high-quality recycling of waste;

g. prevents or reduces waste generation, including the generation of waste from the extraction of minerals and waste from the construction and demolition of buildings;

h. increases preparing for the re-use and recycling of waste;

i. increases the development of the waste management infrastructure needed for prevention, for preparing for re-use and for recycling, while ensuring that the recovered materials are recycled as high-quality secondary raw material input in production, thereby avoiding downcycling;

j. minimises the incineration of waste and avoids the disposal of waste, including landfilling, in accordance with the principles of the waste hierarchy;

k. avoids and reduces litter; or

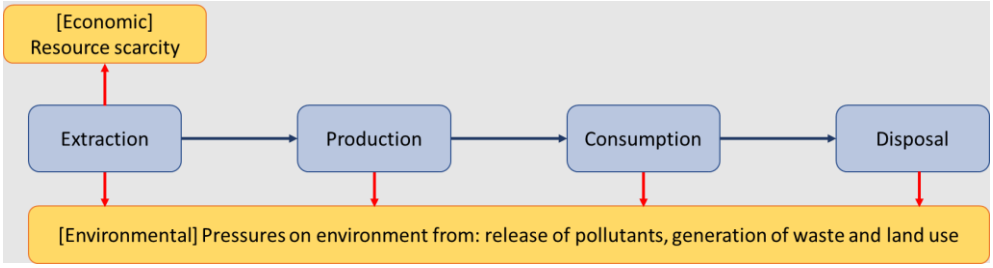
l. enables any of the activities listed in points (a) to (k) of this paragraph in accordance with Article 16

[46] Note: a glossary of key concepts can be found at the end of the report

Article 2 of the Taxonomy Regulation defines '*circular economy*'.

This objective promotes a switch from the traditional linear economy, characterised by a 'take-make-dispose' paradigm, to a circular economy where the value of products and materials is maintained in the economy for as long as possible. By nature, this objective is very material-stream oriented – which does not preclude other resources to be considered as well, such as land, soil and water.

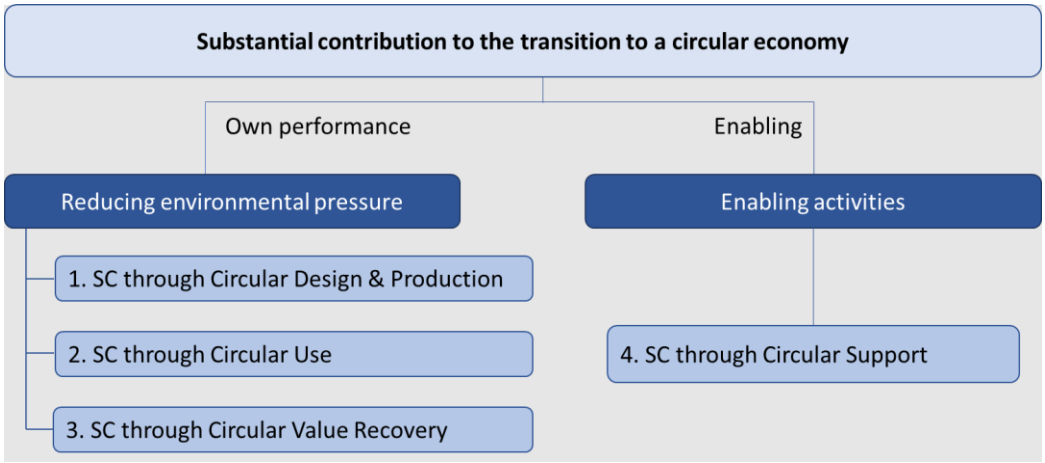
Figure 7: Adverse effects of the linear economy model



The transition to a circular economy objective considers economic as well as environmental aspects. Through circularity, activities along the whole life cycle reduce their environmental impacts (across all other taxonomy objectives) or are even avoided, in which case these impacts are avoided too. For instance, in the case of plastic packaging (e.g., making packaging reusable and/or easier to recycle, having business models that incentive effective reuse and/or recycling) more circularity means a reduction of environmental impacts from the extraction of oil and other raw materials, production of packaging… all the way down to disposal of waste packaging. This reduced environmental impact relates to impacts on climate change mitigation, pollution, water use, and biodiversity. This makes the transition to a circular economy an enabling objective. This has implications on how substantial contribution is defined.

Types of Substantial Contribution and potential approaches

Figure 8: Substantial contribution types to Transition to a circular economy



The '*Categorisation System for the Circular Economy*'[47] report defines four high-level category groups (and several activity categories for each group). From a material life-cycle perspective, the three first categories represent one phase of the circular economy loop (production – use – recovery), while the fourth one applies all along the way. The four categories are:

- **SC 1 Circular Design & Production**: design and produce products and materials with the aim of long term value retention and waste reduction; promote dematerialisation by making products redundant or replacing with radically different product or service
- **SC 2 Circular Use**: life extension and optimized use of products and assets during use phase with the aim of resource value retention and waste reduction support better usage and supporting service
- **SC 3 Circular Value Recovery**: capture value from products and materials in the after use phase
- **SC 4 Circular Support**: develop enabling digital tools and applications, education and awareness raising programs, and advisory services to support circular economy strategies and business models

Throughout the life-cycle, operators may reduce pressures on the environment compared to the actual baseline by performing their activity in a more environmental-friendly way or by substituting harmful activities. Consider the activity of manufacturing a product with significantly longer lifetime and designed to facilitate its value retention (especially at the end-of-life), compared to a similar linear product. This activity would make a positive contribution. Repairing or repurposing a product or asset to extend its lifetime during the use phase or recycling its components at the end-of-life phase would also reduce the pressure on the environment and virgin materials stock compared to the manufacturing of a brand-new product.

However, no activity supporting the transition to a circular economy is considered to improve the state of the environment directly. Indeed, activities are deemed circular by comparison with the linear model and only act relatively to this baseline by reducing the pressure (or enabling such reduction). A waste treatment facility, which reduces the amount of waste and pollutants released compared to the alternative scenario, does not make a net positive impact as an ocean clean-up action or the restoration of a polluted land would do.

Finally, activities can contribute to the CE objective by enabling other circular activities to take place and reduce the pressure on the environment. Advisory services, ICT tools for predictive maintenance, virtual marketplaces for second-hand products, and secondary materials, for instance, represent possible examples.

SC 1 – Circular Design & Production

Rationale:

Choices made during the design phase will have an impact throughout the life cycle of the product. The EU policy on CE in general and the Taxonomy Regulation specifically insists on the potential of the design and manufacture phases to enhance durability, reparability, upgradability, reusability, recyclability, and the use of non-hazardous, reusable, recyclable, traceable bio-sourced and secondary raw materials.

[47] *Categorisation System for the Circular Economy - A sector-agnostic approach for activities contributing to the circular economy*

As such, we identify four types of issues that may be relevant depending on the activity:

- Expected lifetime of the product of the activity and its parts and materials (how long can products and materials be kept in use, through measures such as resource efficiency, durability, functionality, modularity, upgradability, easy disassembly, and repair).
    - Possible indicators: failure rates over the expected lifetime, accelerated lifetime testing, warranty duration, possibility to repair products by making spare parts and repair instructions available to users, software updates (where relevant), etc.
- Materials used by the economic activity (designing out substances of concern; increasing the share of reusable, recyclable, traceable bio-sourced, compostable, and secondary raw materials; reducing the use of primary raw materials).
    - Possible indicators: levels of recyclable, recycled, (traceable) bio-sourced materials
- Ensuring the products of the activity can be remanufactured, prepared for re-use, or recycled when reaching their end of life (through measures such as design for recyclability, traceability of materials contained in products).
    - Possible indicators: information provided for easy dismantling and recyclability, etc.
- Production processes (and enabling technology) that reduce waste by closing material loops and introducing production residues and by-products of other processes (e.g., through industrial symbiosis) in a manner that goes beyond standard industry practice. Pooling resources and optimised logistics also contribute to that direction.

Examples of activities (for illustration only):

Manufacture of consumer electronics: Electronics and ICT are identified, among others, as crucial material streams for the March 2020 Circular Economy Action Plan[48]. Suppose the lifespan of a product is identified to be the main leverage to substantially reduce the overall environmental impact of the activity (which includes the impact of the product itself during its life). The manufacture of consumer electronics can make a SC by manufacturing products with an extended lifetime and the possibility of upgrading and repairing it to avoid premature technological obsolescence or redundancy (by comparison with the other products).

Potential approaches:

As seen from the multiple influence factors and associated indicators (lifetime, materials, end-of-life…) in the rationale above, it is unlikely that the full range of impacts can be captured within one or a few metrics or proxies. Depending on the individual activity, **one particular dimension** may be responsible for most of the environmental impact and be selected to define the substantial contribution criteria. If **several dimensions** equally need to be taken into account, it is still possible to have **cumulative criteria** for substantial contribution (e.g. minimum warranty *and* minimum share of recycled content), taking care to ensure technical feasibility. Such an assessment about the most important dimension(s) needs to be carried out for each activity.

From a circular economy point of view, an activity's impact will often depend mostly on the **underlying product** (designed and/or produced by the activity). For activities that are similar in terms of process, materials, and associated impacts (e.g., manufacture of computers and manufacture of mobile phones, both manufacturing consumer electronics), the underlying products can be quite different, thus requiring different quantitative or qualitative criteria. A single quantitative or qualitative criterion would not be suitable for both activities. Hence, it will be necessary to develop

[48] https://ec.europa.eu/environment/circular-economy/

criteria specific to the product-level (read 'activity manufacturing a specific product') unless a process-based approach is selected. This can be extremely time-consuming to cover many activities unless building on the existing analysis (such as EU Ecolabel criteria for a certain product group).

Finally, no activity that makes a substantial contribution through Circular Design and Production will *a priori* have a close-to-zero impact on the environment but rather **reduce the impact compared to the BAU scenario** from a life-cycle perspective. Thus, in setting the level of ambition of substantial contribution for an activity, it seems more promising to start from the market performance or best practices, rather than identify a target performance level and evaluate afterwards that this ambition is reachable for the market players. With the latter approach, identifying the appropriate level of ambition would be potentially very complex, as it requires starting from EU policy or scientific recommendations (usually covering many different activities) and reaching an activity-specific target through several assumptions.

Table 4: Suitability of the approaches to the SC 1

Approach	Suitability	Rationale / Caveat / Comment
(1) Impact-based	Very unlikely	Too many factors to exhaustively assess the overall impact of one activity and to identify an activity-specific impact target
(2) Performance in relation with the environmental target	Unlikely	Would require, for each individual activity to connect the environmental target to an activity-specific performance level (and hence the identification of the relevant proxy) and check technical feasibility
(3) Best-in-class performance	Possible	Possible if one can constitute best in class performance in a sector or sub-sector and if a relevant indicator is identified for the given individual activity.
(4) Relative improvement	Very unlikely	Wouldn't respect level playing field requirement
(5) Practice-based	Possible	Possible to set some best practices for some activities. However, given the potential high number of individual activities, it could become very time-consuming unless building on existing analysis and predefined certification systems.
(6) Process-based	Possible	Possible and could potentially cover several activities at once[49]. Needs to be technically robust enough.
(7) Nature of the activity	Unlikely	Unlikely to have a Design & Production activity good enough to be automatically aligned without specification on the way it is carried out.

Note that a combination of generic approaches is possible, in particular when requiring cumulative SC types (e.g. best-in-class approach regarding warranty duration AND threshold in relation with the sectoral environmental target for the quantity of secondary raw material included). However, it must be ensured that the requirement level of the criteria is technically feasible.

[49] See examples from the report 'Categorisation System for the Circular Economy - A sector-agnostic approach for activities contributing to the circular economy'

SC 2 - Circular Use

Rationale:

Once products or services enter their use phase, several actions can be carried to optimize their lifetime and use. Substantial contribution to improve Circular Use can be split into two (not necessarily mutually-exclusive) categories:

- Life extension: Prolong the product or component lifetime (through maintenance, repair; reuse, refurbish, remanufacture, repurpose activities). The attention should be on the environmental cost of such a life extension compared to a product replacement (quantity of energy and resource needed, waste and pollution generated).
    - Possible indicators: avoided waste, net resource saving, number of hours of use gained
- Intensive Use: Make the product's use more intensive, notably through innovative business models (e.g., through Product-as-a-Service, pay-per-use, subscription, reuse and, sharing models, etc.). Attention should be paid to measure offset effects on lifetime (increase intensity may lead to shortened lifetime, e.g.).
    - Possible indicator: Number of hours of use over the whole lifetime (to be compared with a BAU model), resulting in avoided waste and net resource saving.

Longer and more intensive use of products both contribute to reducing the need for new products: if two persons can use one product instead of one, or if the product lasts twice longer, the need for a second similar product disappears, together with the associated environmental impact. Life-cycle considerations are key here.

Examples of activities (for illustration only):

Repair[50] of computers: An activity such as repair of computers enables the product (computer) to be used for a longer period. Hence, it reduces the amount of waste and negative externalities by substituting the resource-intensive need for a new product.

Potential approaches:

As for the conception phase, potential impacts are multifactorial and hard to assess throughout the life-cycle exhaustively. If activities allowing for life extension and more intensive use can contribute to reducing that impact, it is difficult to quantify this overall impact reduction. The difficulty lies in identifying a relevant indicator that allows robustly assessing the activity's performance, and that is commonly accepted and used by the market players. Suppose no such quantitative indicator can be found for a given activity. In that case, the qualitative approaches can provide an adequate level of suitability: a set of minimal safeguard practices or processes (or even none if the nature of the activity offers enough guarantee) could be used as SC criteria. This is, in particular, the case when the BAU scenario (requiring more new products instead of using more intensively and extending lifetime) leads to a much higher impact than the scenario in which the circular activity takes place.

[50] Note that all repair activities won't necessarily substantially contribute to the CE objective (in addition to the stringency of the level of ambition for every activity (see section C.5)). For instance, for products and assets with a long lifetime (e.g. cars), regular repair is normal practice and may not be considered to intrinsically lead to a substantial contribution.

Table 5: Suitability of the approaches to the SC 2

Approach	Suitability	Rationale / Caveat / Comment / Example
(1) Impact-based	Unlikely	Too many factors to exhaustively assess the overall impact of one activity and to identify an activity-specific impact target
(2) Performance in relation with the environmental target	Possible	For example, for an activity extending the life-time of a product, one can set a minimum warranty.
(3) Best-in-class performance	Possible	Setting the ambition level based on the best performing activities can be too stringent and exclude activities with an environmental performance that is good enough. For example, for an activity remanufacturing consumer electronics, the products may perform less well than their direct competitors, but still lead to reductions in impact compared to a linear activity manufacturing consumer electronics from a LCA perspective.
(4) Relative improvement	Possible	For intensive use: for instance, if a robust comparison between the circular business model and the BAU demonstrates enough saving for the relevant metric. Would respect the level playing field requirement as the 'initial performance' would be a fixed BAU performance similar for all players.[51]
(5) Practice-based	Likely	Possible to set some best practices for some activities.
(6) Process-based	Likely	Could cover several activities at once[52]. Needs to be robust, ambitious and verifiable.
(7) Nature of the activity	Likely	If the relevant generic activity is defined as including circular activities only (e.g. remanufacturing of consumer electronics), these activities outperform the corresponding linear activities (e.g. manufacturing of consumer electronics). Hence, no criteria defining environmental performance are needed (e.g. material efficiency) and the definition of the generic activity is sufficient to ensure SC.

SC 3 - Circular Value Recovery

Rationale:

Activities related to end-of-life, waste management, and waste valorisation ultimately reduce the pressure on the environment: First, they reduce the amount (and sometimes toxicity) of waste disposal. Second, by contributing to restoring with secondary raw materials the stock of materials available for human activities, they help reduce the pressure on virgin materials and the impacts associated to the extraction. The Waste Framework Directive[53] establishes the waste hierarchy (i.e., a priority order in waste prevention and management): 1/ Prevention, 2/ Preparation for re-use, 3/ Recycling, 4/ Recovery, 5/ Disposal.

Examples of activities (for illustration only):

Sorting and recycling of co-mingled packaging waste: Such an activity reduces the direct and the indirect pressure on the environment due to the exploitation of raw-resources instead of recycled ones.

[51] Note that in this case, the approach is not a performance improvement of the activity over time, but a relative improvement compared to the alternative scenario.

[52] See examples from the report *'Categorisation System for the Circular Economy - A sector-agnostic approach for activities contributing to the circular economy'*

[53] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32008L0098

Potential approaches:

Once again, the overall impact is difficult to assess as it cuts across several other objectives (impact on biodiversity, on water, on pollution, etc.), and it is context-specific and material-specific. Several quantitative indicators (e.g., weight or share of waste collected, recycled, recovered for several streams of materials) exist and are used both by legislation and market players. As such, as the Taxonomy Regulation (Article 19) encourages to use quantitative metrics when possible, quantitative (performance-based) approaches are more likely to be selected here.

Table 6: Suitability of the approaches to the SC 3

Approach	Suitability	Rationale / Caveat / Comment
(1) Impact-based	Unlikely	Too many factors to exhaustively assess the overall impact of one activity and to identify an activity-specific impact target
(2) Performance in relation with the environmental target	Likely	Quantitative indicators widely adopted. The EU sets clear recycling/recovery/etc. targets at MS level which could be translated at activity level
(3) Best-in-class performance	Likely	Quantitative indicators widely adopted. Comparison possible for the different activities of the sector
(4) Relative improvement	Unlikely	Wouldn't respect level playing field requirement
(5) Practice-based	Possible	Possible to set some best practices for some activities.
(6) Process-based	Possible	Possible and could potentially cover several activities at once[54]. Needs to be robust, ambitious and verifiable.
(7) Nature of the activity	Possible	Some activities may be deemed always substantially contributing whatever the way they perform.

SC 4 - Circular Support

Rationale:

Activities reducing the environmental pressures through circular means can be fostered by enabling activities. Two categories of enabling activities can be distinguished:

- A category of enablers that act on individual activities listed above (own performance activities for SC types 1, 2 and 3) to improve their impact. Examples include advisory services, activities providing (digital) tools for eco-conception, predictive maintenance, resource efficiency, development and manufacturing of equipment and machinery intended to enable circular production and waste management, etc.
- A category of enablers that intervene at the interface between different activities. Indeed, as a material-stream-oriented objective, the circular economy requires to better handle the transfer of material between different operators, particularly when the waste of one operator can be a resource for another. Examples may include digital marketplaces for second-hand products or materials and activities involved in setting up industrial symbiosis strategy (e.g., installation of pipelines to transfer waste heat).

[54] See examples from the report '*Categorisation System for the Circular Economy - A sector-agnostic approach for activities contributing to the circular economy*'

Potential approaches:

Table 7: Suitability of the approaches to the SC 4

Approach	Suitability	Rationale / Caveat / Comment
(1) Impact-based	Unlikely	Too many factors to exhaustively assess the overall impact of one activity and to identify an activity-specific impact target
(2) Performance in relation with the environmental target	Unlikely	The enabling activity should not be judged on its own performance but on its enabling potential to improve an underlying's activity performance.
(3) Best-in-class performance	Unlikely	The enabling activity should not be judged on its own performance but on its enabling potential to improve an underlying's activity performance.
(4) Relative improvement	Possible	Comparison of the performance of the underlying activity or situation before and after the enabling has taken place – respects the level playing field, as it's the enabler which is judged and not the underlying activity.
(5) Practice-based	Unlikely	These enabling activities have been less studied that the ones of the 3 other categories. As such it would probably require more energy to identify best practices and demonstrate their better overall impact.
(6) Process-based	Possible	Possible and could potentially cover several activities at once[55]. Needs to be robust, ambitious and verifiable.
(7) Nature of the activity	Possible	Some activities may be deemed always substantially contributing whatever the way they perform.

Summary table

Table 8: Suitability of approaches across all the SC types

	Suitability			
Approach	**SC 1 – Circular Design and Production**	**SC 2 – Circular Use**	**SC 3 – Circular Value Recovery**	**SC 4 – Circular Support**
(1) Impact-based	Very unlikely	Unlikely	Unlikely	Unlikely
(2) Performance in relation with the environmental target	Unlikely	Possible	Likely	Unlikely
(3) Best-in-class performance	Possible	Possible	Likely	Unlikely
(4) Relative improvement	Very unlikely	Possible	Unlikely	Possible
(5) Practice-based	Possible	Likely	Possible	Unlikely
(6) Process-based	Possible	Likely	Possible	Possible
(7) Nature of the activity	Unlikely	Likely	Possible	Possible

[55] See examples from the report '*Categorisation System for the Circular Economy - A sector-agnostic approach for activities contributing to the circular economy*'

Reference points to set the level of ambition

Annex A.2 provides a non-exhaustive listing of EU policies and targets relative to Circular Economy. These elements can be used as points of reference when establishing the level of ambition corresponding to the substantial contribution.

Tables include for instance targets for recycling rate of plastic from the Single Use Plastics Directive or the objective to establish a right to repair for electronics and ICT set in the new Circular Economy Action Plan, etc. Ideal end-states from the new Circular Economy Action Plan[56] also offer some guidance: Decoupling economic growth from resource use and waste generation and keeping the resource consumption within planetary boundaries.

Further considerations

Should we consider land (territory/space, not ground) and energy aspects (e.g. energy efficiency, waste heat recovery, recovery of materials – under certain conditions – for use as fuels) as part of circular economy or not? The land does not appear explicitly in the Taxonomy Regulation (Article 14), while energy efficiency is mentioned, and so is waste management (where recovery appears in penultimate position in the waste hierarchy) but energy recovery is at the same time in some cases considered to make significant harm to this objective. Careful consideration is thus needed on whether and the extent to which these aspects are considered (e.g. only where part of making an activity more circular overall).

When setting the level of ambition for Circular Economy, one risk is to be too stringent and as such to prevent almost anyone to qualify (too ambitious to incentivize general change). On the other hand, if the level of ambition is too low, one risks distortion across the taxonomy among the different objectives (see section C5). One should also keep in mind that the taxonomy is not the only policy tool to foster change in the market.

There may be some contradiction among several sub-objectives: for instance, for activities manufacturing smartphones, upgradability and reparability (which requires easy dismantling) might enter in contradiction with durability (which may use glue to have a product more resistant to shocks and water than with screws). Improvements across all sub-objectives may sometimes be impossible and some trade-offs have to be found for each activity (and their relying products or services) based on the available state of the art.

[56] See https://ec.europa.eu/environment/circular-economy/pdf/new_circular_economy_action_plan.pdf

F. Pollution prevention and control

Introduction

Article 14 of the Taxonomy Regulation defines when an economic activity[57] has to be considered to contribute substantially to pollution prevention and control environmental objective.

An economic activity shall qualify as contributing substantially to pollution prevention and control where that activity contributes substantially to environmental protection from pollution by:

a. preventing or, where that is not practicable, reducing pollutant emissions into air, water or land, other than greenhouse gasses;

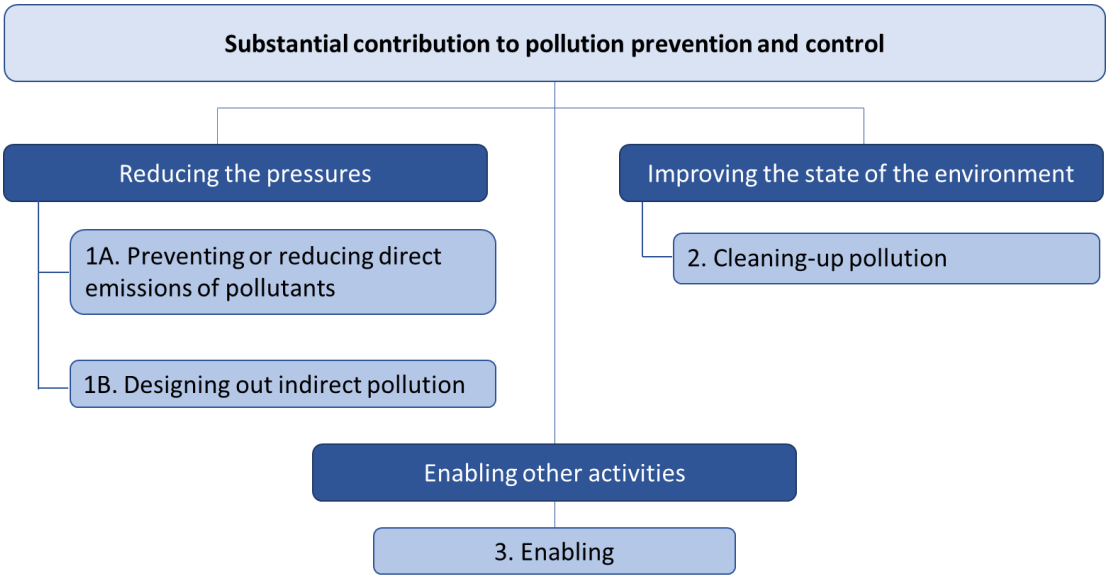
b. improving levels of air, water or soil quality in the areas in which the economic activity takes place whilst minimising any adverse impact on, human health and the environment or the risk thereof;

c. preventing or minimising any adverse impact on human health and the environment of the production, use or disposal of chemicals;

d. cleaning-up litter and other pollution; or

e. enabling any of the activities listed in points (a) to (d) of this paragraph in accordance with Article 16.

Article 2 of the Taxonomy Regulation defines '*pollution*' and '*pollutant*'.



[57] Note: a glossary of key concepts can be found at the end of the report

Figure 9: Substantial contribution types of Pollution prevention and control

Types of Substantial Contribution and potential approaches

Four types of substantial contribution[58] were identified for an activity to substantially contribute to pollution prevention and control:

- **SC 1A: preventing or, where that is not practicable, reducing direct emissions of pollutants** to air, water and land. Activities with high direct pollution emissions (in sectors such as agriculture, transport, manufacturing, etc.) can reduce the pressure they directly exert on the environment compared to the baseline*.
- **SC 1B: designing out indirect pollution.** Activities manufacturing products or providing services with high emissions over their life-cycle can reduce the overall pressure exerted on the environment by designing the product or service in such a way to reducing or eliminating these emissions. This includes:
    - Emission from the use phase (for instance, considering a car manufacturing activity tackeling and minimizing the emissions of its cars during use phase);
    - Emissions from the end-of-life phase (for instance, a battery manufacturer reducing potential environmental impacts of the end-of-life product or ensuring safe recovery)
    - Upstream emissions if relevant (an activity selecting materials or components that have smaller emissions during extraction or production phase).
- **SC 2: cleaning up pollution.** Activities performing remediation may directly improve the state of the environment. For instance, the remediation of a former industrial site where land is polluted with chemicals or technologies cleaning litter pollution from the ocean.
- **SC 3: enabling any of the activities above.** An activity, for instance, providing solutions to measure or abate pollutants' emissions (e.g., manufacture of NOx filters).

There is a strong connection between the SC type 1B (designing out indirect pollution) and the circular economy SC type 1 (circular design and production). Both of them are based on pressures of underlying products or services throughout their life-cycle, especially downstream. Furthermore, the circular economy environmental objective, as defined in article 13 of the Taxonomy Regulation, explicitly seeks to 'substantially reduce the content of hazardous substances and substitutes substances of very high concern in materials and products throughout their life cycle.'

SC types 1A and 1B to the pollution prevention and control objective aim to reduce the pressure of the activity, either directly or indirectly. Note that those SC are not mutually exclusive: for a given generic activity, depending on the major sources of impacts and reduction potential along the value chain, an economic operator can decide to focus on the phases responsible for only the direct, only the indirect, or both types of pressures. In this report, it was decided to split those two types of SC because (a) different approaches are expected to define criteria depending on the type of SC, and (b) to highlight the similarities of the pollution prevention and control SC type 1B and the circular economy SC type 1 that may be adopted together.

[58] Note: a glossary of key concepts can be found at the end of the report

SC 1A – Reducing direct emissions of pollutants

Rationale:

Some activities are directly responsible for emissions of large amounts of pollutants in air, land or, water. This can be either point pollution (e.g., plants emitting SOx to the atmosphere) or diffuse pollution (e.g., agriculture responsible for the deposition of NH3 emissions in the soil across the fields, as well as water pollution due to nitrogen runoff). Reducing those direct emissions can be done with incremental improvement (for instance, improving the processes to reduce or filter better the pollutant emissions), or transformational change (removing the pollutions with paradigm change, for instance, switching from a diesel car to an electric vehicle for a transport operator).

- Possible indicators: Amounts of pollutants emitted (by pollutant) absolute or per functional unit (e.g., mg NOx per km travelled); concentration of pollutants in effluents or in the atmosphere, receiving water body or land; specific substances contained in products or input materials (e.g., sulphur content in maritime fuel, maximum content of VOCs in paints)

Examples of activities (for illustration only):

Activities from the chemical industry[59] can be associated with non-negligible emissions of polluting substances (e.g., sulphur dioxide and other sulphur compounds, volatile organic compounds, etc.). The implementation of certain best techniques or practices can reduce the emissions hence the environmental pressure and impact, compared to average performers.

Potential approaches:

Emissions into the atmosphere can be accurately estimated using information about activity levels and emission factors. The overall impact of an activity may yet be difficult to assess as it depends on the various types of pollution, and it is context-specific. Several absolute or per functional unit quantitative indicators are widely used in legislation and by economic operators. As such, as the Taxonomy Regulation (Article 19) encourages to use quantitative metrics when possible, quantitative (performance-based) approaches are more likely to be selected for SC 1. However, given the large amount of possible types of pollution, qualitative approaches may also be suitable if they can ensure enough robustness and the ability to substantially contribute to the reduction of direct emissions.

Table 9: Suitability of the approaches to the SC 1

Approach	Suitability	Rationale / Caveat / Comment
(1) Impact-based	Unlikely	At least for atmospheric emissions, there are ways to quantify the pollution (based on emission factors and activity levels). However, it would then require to compare at local level the state of the environment with the pressure (emissions) the activity can exert on it.
(2) Performance in relation with the environmental target	Possible	At least for atmospheric emissions, there are ways to quantify the pollution (based on emission factors and activity levels), that could then be connected to policy- or scientific-derived requirements.
(3) Best-in-class performance	Possible	Possible if a relevant metric is identified for the given individual activity.
(4) Relative improvement	Very unlikely	Wouldn't respect level playing field requirement
(5) Practice-based	Possible	Possible to set some best practices for some activities. However, given the potential high number of individual activities, it could become very time-consuming unless building on existing analysis.

[59] For instance as listed in the Annex 1 of the Industrial Emission Directive

(6) Process-based	Possible	Possible but needs to be technically robust enough to ensure environmental ambition.
(7) Nature of the activity	Unlikely	Unlikely to have an activity good enough to be automatically eligible without specification on the way it is carried out.

SC 1B - Designing out indirect pollution

Rationale:

Choices made during the design phase will impact the life cycle of the product. This type of SC recognises some activities' ability to limit/avoid pollution caused during the upstream and downstream life cycle stages. Activities that can limit/avoid pollution generated in the upstream phase of their operation (e.g., by selecting components that have smaller emissions during extraction or production phase or by reducing the amount of feedstock materials used) and downstream phase (e.g. resource-efficient end-of-life treatment of the products manufactured) are covered under this type of substantial contribution.

- Possible indicators: amounts of pollutants emitted by the product or service during its use phase (absolute or per functional unit);

Examples of activities (for illustration only):

Manufacture of fully electric vehicles - Road vehicles relying on internal combustion engines emit a number of pollutants when used, for instance, NOx and PM. Fully electric vehicles (i.e., not depending on any combustion engine) do not emit any of these pollutants in the use phase. Therefore, the manufacture of fully electric vehicles contributes to the reduction of indirect pollution during the use phase, apart from the emissions associated with the electricity production.

Potential approaches:

The overall impact of an activity is difficult to assess as it depends on (i) the indirect reduction of pollution and (ii) the type of pollution that is context-specific. Several absolute or per functional unit quantitative indicators are widely used to assess the level of pollution or emissions in legislation and by economic operators. However, the assessment of the indirect benefit in reducing pollution seems generally rather complex. As the Taxonomy Regulation (Article 19) encourages to use quantitative metrics when possible, quantitative (performance-based) approaches are more likely to be selected for SC 1B. However, given the large amount of possible types of pollution and the complexity of calculating the indirect reduction of pollution, qualitative approaches may also be suitable, if they can ensure enough robustness and the ability to substantially contribute to the reduction of direct emissions.

Table 10: Suitability of the approaches to the SC 1B

Approach	Suitability	Rationale / Caveat / Comment
(1) Impact-based	Very unlikely	Too many factors to exhaustively assess the overall impact of one activity and to identify an activity-specific impact target for reducing indirect pollution
(2) Performance in relation with the environmental target	Unlikely	Would require, for each individual activity, to connect the environmental target to the benefit – reducing indirect pollution – caused by the activity (and hence the identification of the relevant proxy).
(3) Best-in-class performance	Possible	Possible if a relevant metric is identified for the given individual activity.
(4) Relative improvement	Very unlikely	Wouldn't respect level playing field requirement
(5) Practice-based	Possible	Possible to set some best practices for some activities. However, given the potential high number of individual activities, it could become very time-consuming unless building on existing analysis.
(6) Process-based	Possible	Possible but needs to be technically robust enough to ensure environmental ambition.
(7) Nature of the activity	Possible	There may be activities that by nature could ensure enough environmental ambition to reduce indirect pollution.

SC 2 - Cleaning up pollution

Rationale:

Activities remediating polluted water bodies (also refer to the Water objective – Section D), land and air have a positive impact and contribute to the pollution prevention and control objective by directly improving the state of the environment.

- Possible indicators: Area of land remediated, amount of waste/pollutants removed, residual concentration of pollutants after the remediation/clean-up

Examples of activities (for illustration only):

Remediation of polluted land-sites: Former industrial sites that hosted a number of polluting industries in the past decades (e.g., production of chlorine-soda) may experience land pollution from e.g., heavy metals. The remediation of such polluted sites can take place by implementing a number of actions (for instance, removal of polluted soil and appropriate treatment) that can reduce the concentration of pollutants.

Potential approaches:

Table 11: Suitability of the approaches to the SC 2

Approach	Suitability	Rationale / Caveat / Comment
(1) Impact-based	Unlikely	Too many factors to exhaustively assess the overall impact of the activity
(2) Performance in relation with the environmental target	Unlikely	Unlikely to measure metrics on intrinsic performance of the activity as the clean-up is very context-specific.
(3) Best-in-class performance	Very unlikely	Can be too stringent and leave-out operators that have positive impact.
(4) Relative improvement	Very unlikely	Would leave-out already good performers, hence it could be too stringent and it does not respect the level playing field requirement.
(5) Practice-based	Possible	Possible to set some best practices for some clean-up activities.
(6) Process-based	Possible	Needs to be technically robust enough.
(7) Nature of the activity	Likely	Some activities may be deemed always substantially contributing whatever the way they perform. E.g: restoration of polluted land-sites

SC 3 - Enabling activities

Rationale:

Several activities may contribute to the pollution objective by enabling activities to reduce the pressure on the environment or improve the state of the environment. Examples of such activities include:

- The provision of equipment or technologies to prevent or reduce the emissions of other activities, traceability solutions or solutions for remediation, as well as management of take-back schemes for products at their end-of-life.
- Activities providing information or advice: for instance, consultancy services for environmental-friendly product design, information or training to users for proper management of products during their use-phase and end-of-life

Examples of activities (for illustration only):

An activity manufacturing efficient NOx filters enables its customers to reduce their NOx emissions hence the pressure they exert on the environment.

Potential approaches:

Table 12: Suitability of the approaches to the SC 3

Approach	Suitability	Rationale / Caveat / Comment
(1) Impact-based	Unlikely	Indirect, too many factors to exhaustively assess the overall impact of one activity and to identify an activity-specific impact target.
(2) Performance in relation with the environmental target	Unlikely	The enabling activity should not be judged on its own performance but on its enabling potential to improve an underlying's activity performance.
(3) Best-in-class performance	Unlikely	The enabling activity should not be judged on its own performance but on its enabling potential to improve an underlying's activity performance.
(4) Relative improvement	Possible	Comparison of the performance of the underlying activity or situation before and after the enabling has taken place – respects the level playing field, as it's the enabler which is judged and not the underlying activity.
(5) Practice-based	Unlikely	Given the wide range of enabling activities possible the identification of best practices and demonstration of their good overall impact seems, if possible, very complex and time-consuming.
(6) Process-based	Possible	Possible and could potentially cover several activities at once. Needs to be robust, ambitious and verifiable.
(7) Nature of the activity	Possible	Some activities may be deemed always substantially contributing whatever the way they perform.

Summary table

Table 13: Suitability of approaches across all the SC types

	Suitability			
Approach	**SC 1A – Preventing or reducting direct emissions**	**SC 1B – Designing out indirect emissions**	**SC 2 – Cleaning up pollution**	**SC 3 – Enabling**
(1) Impact-based	Unlikely	Very unlikely	Unlikely	Unlikely
(2) Performance in relation with the environmental target	Possible	Unlikely	Unlikely	Unlikely
(3) Best-in-class performance	Possible	Possible	Very unlikely	Unlikely
(4) Relative improvement	Very unlikely	Very unlikely	Very unlikely	Possible
(5) Practice-based	Possible	Possible	Possible	Unlikely
(6) Process-based	Possible	Possible	Possible	Possible
(7) Nature of the activity	Unlileky	Possible	Likely	Possible

Reference points to set the level of ambition

Annex A.3 provides a non-exhaustive listing of EU policies and targets relative to pollution prevention and control. These elements can be used as points of reference when establishing the level of ambition corresponding to the substantial contribution.

G. Protection and restoration of biodiversity and ecosystems

The views regarding the substantial contribution types for protection and restoration of biodiversity and ecosystems have developed significantly based on the work of the Platform on Sustainable Finance experts. As such, the substantial contribution types described are based on the proposal included as part of the Platform on Sustainable Finance's draft recommendations report[60].

Introduction

Article 15 of the Taxonomy Regulation defines when an economic activity[61] has to be considered to contribute substantially to the protection and restoration of biodiversity and ecosystems environmental objective.

> An economic activity shall qualify as contributing substantially to the protection and restoration of biodiversity and ecosystems where that activity contributes substantially to protecting, conserving or restoring biodiversity or to achieving the good condition of ecosystems, or to protecting ecosystems that are already in good condition, through:
>
> a. nature and biodiversity conservation, including achieving favourable conservation status of natural and semi-natural habitats and species, or preventing their deterioration where they already have favourable conservation status, and protecting and restoring terrestrial, marine and other aquatic ecosystems in order to improve their condition and enhance their capacity to provide ecosystem services;
>
> b. sustainable land use and management, including adequate protection of soil biodiversity, land degradation neutrality, and the remediation of contaminated sites;
>
> c. sustainable agricultural practices, including those that contribute to enhancing biodiversity or to halting or preventing the degradation of soils and other ecosystems, deforestation and habitat loss;
>
> d. sustainable forest management including practices and uses of forests and forest land that contribute to enhancing biodiversity or to halting or preventing degradation of ecosystems, deforestation and habitat loss;
>
> e. enabling any of the activities listed in points (a) to (d) of this paragraph in accordance with Article 16.

The Taxonomy Regulation, Article 2 defines '*ecosystem*', '*ecosystem services*', '*biodiversity*', '*good condition*' and '*good environmental status*'.

Ecosystems, through their ecological and evolutionary processes, sustain the quality of the air, fresh water and soils on which humanity depends. They distribute fresh water, regulate the climate, provide pollination and pest control and reduce the impact of natural hazards. Ecosystems thus play a critical role in providing ecosystem services fundamental for people's physical well-being and for maintaining culture. The sustained delivery of ecosystem services requires healthy ecosystems in good condition. This means above all, a good abiotic and structural quality and high levels of biodiversity at all scales, from genetic and phenotypic diversity within populations, to diversity among populations and ecological or morphological types within species, species diversity and phylogenetic and functional diversity within communities, and diversity of communities, ecosystems and land and seascapes.

Ecosystems and their vital contributions to people are, however, deteriorating worldwide. IPBES[62] cites five main drivers[63] for this degradation: habitat conversion and land use or sea use change; over-

[60] https://ec.europa.eu/info/publications/210803-sustainable-finance-platform-technical-screening-criteria-taxonomy-report_en
[61] Note: a glossary of key concepts can be found at the end of the report
[62] The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
[63] See also 5th MAES report: https://ec.europa.eu/environment/nature/knowledge/ecosystem_assessment/pdf/5th%20MAES%20report.pdf

exploitation of natural resources; climate change; pollution and nutrient enrichment; and invasion of alien species. Protecting and restoring biodiversity and ecosystems is then key to benefit from their ecosystem services.

Different ecosystem types coexist. We can list for instance: Urban ecosystems; Agroecosystems (which include cropland and grassland); Forests and woodland: heathland and shrub, sparsely vegetated land and wetlands; freshwater ecosystems (rivers and lakes); marine ecosystems.[64]

One of the key differences between the biodiversity and ecosystems objective and the other ones comes from the natural evolution of the state of the environment. Having a naturally dynamic state of the environment leads to differences with the other objectives. For instance, this naturally dynamic state means that the pressures exerted by human activities may be lowered to a level that can be absorbed by the environment and is completely sustainable. In the same way, protecting the ecosystem is can lead to improving its condition.

Another implication from the dynamic state and the high context-dependency is that there is no uniform benchmark/reference (similar to the zero GHG emissions for climate change mitigation). On pressure, zero anthropic pressure could be used as a benchmark, but for the condition of ecosystems, several options co-exist (intact ecosystem, least disturbed state, historical state, potential vegetation, etc.). For biodiversity what is considered as 'good' will depend a lot on the current state of the environment; in other words, moving towards a field with 20 plant species may be good under some, but insufficient under other conditions.

Types of Substantial Contribution

Six types of substantial contribution were identified for an activity to substantially contribute to the protection and restoration of biodiversity and ecosystems:

- **SC 1A:** for activities conserving the state of semi-natural or natural ecosystems
- **SC 1B**: for activities improving the state of semi-natural or natural ecosystems
- **SC 2A**: for activities maintaining sustainable use of managed ecosystems
- **SC 2B:** for activities reducing the pressure on managed ecosystems
- **SC 3:** for activities mitigating previous impacts
- **SC 4**: for activities enabling other activities to make a substantial contribution

The logic for differentiating between these types of substantial contribution is based on the following key factors:

- There is a material difference between semi-natural or natural ecosystems (such as a native forest) and those which are subject to a high degree of modification (such as grazed land). Both have important biodiversity, but the desired end state for the ecosystem requires a nuance in approach when developing technical screening criteria.
- Maintaining state (where already good) and improving state (where poor) are important in both (semi-) natural and managed ecosystems
- Reducing pressures on ecosystems is an important activity, but should only be recognised as a substantial contribution where a substantial and genuine state change is realised, rather than small, incremental changes that do not deliver on the headline ambition level.

[64] Mapping and Assessment of Ecosystems and their Services, https://ec.europa.eu/environment/nature/knowledge/ecosystem_assessment/pdf/5th%20MAES%20report.pdf

There are cases where one economic activity may be addressing and mitigating the legacy harmful impact of another. These activities are specific in nature and different from an activity improving its own performance.

SC 1A - Conserving the state of semi-natural or natural ecosystems

An activity can make a substantial contribution by directly maintaining or protecting the good ecological condition of specific semi-natural or natural ecosystem(s).

SC 1B - Improving the state of semi-natural or natural ecosystems

An activity can make a substantial contribution if it directly and substantially improves the condition of a semi-natural or natural ecosystem compared to its current condition. Progress needs to be assessed against the baseline condition and reference reporting period[65].

SC 2A - Maintaining sustainable use of managed ecosystems

An activity can make a substantial contribution if it achieves a sustainable use of a managed ecosystems. These should include robust scientific information and recognised national/EU/international references indicating a quantitative threshold within which the **existing** activity is able to achieve a sustainable use of the ecosystem(s), as defined in the CBD[66]. The existing activity[67] shall also:

- not result in net increase of pressure on natural resource;
- prove through third party verification that it can respect this threshold over time.
- have reached compliance with best-in-class sector standards

Identifying a level of pressure acceptable to the ecosystem that matches its regeneration capacity can be challenging. The MAES[68] has made substantial progress in describing the state of ecosystem services in Europe but is not geared to provide a specific threshold of acceptable impact for each ecosystem type and for each type of economic activity[69]. The state of knowledge in this regard differs between types of ecosystems. Identifying these thresholds of sustainable use for all kinds of economic activities is extremely complex.

SC 2B - Reducing the pressure on managed ecosystems

An activity or measure can make a substantial contribution by leading to a reduction of the existing pressure on a managed ecosystem, contributing to reach the sustainable use level and complying with requirements under SC 2A.

The activity or measure shall also:

- be commensurate in level and time to the relevant environmental objective; and
- be accompanied by a credible and time-bound plan to reach the sustainable use level;

[65] CBD 'Comment on Baselines for SBSTTA 24 Item 3'

[66] CBD, Art. 2 defines 'sustainable use' as follows: Art 2: "'Sustainable use' means the use of components of biological diversity in a way and at a rate that does not lead to the long-term decline of biological diversity, thereby maintaining its potential to meet the needs and aspirations of present and future generations.'

[67] Existing Activities are intended as those where land use change and/or morphological modification of water body has already occurred in the past.

[68] The Biodiversity Strategy called on Member States to map and assess the state of ecosystems and their services in their national territory with the assistance of the European Commission. This ongoing work is part of the EU methodology to map, assess and achieve good condition of ecosystems so they can deliver benefits such as climate regulation, water regulation, soil health, pollination and disaster prevention and protection. The final assessment has to be adopted by the end of 2021 to support the legally-binding biodiversity restoration targets. Mapping and Assessment of Ecosystems and their Services - MAES - Environment - European Commission (europa.eu).

[69] In addition, the pressure on the ecosystem can come from several activities (whether these are part of the same sector / category of activities or from different sectors), while taxonomy criteria in principle define a maximum level of pressure for a single activity / installation / asset.

Progress needs to be assessed against the baseline condition and reference reporting period[70].

SC 3 - Mitigating previous impacts

An activity or measure can make a substantial contribution by significantly contributing to mitigating[71] the damage/impact caused by a previous activity/measure ('legacy impact'). This includes any intervention/measure that can reduce the operational impacts on biodiversity of an existing infrastructure (e.g. wildlife passages on a road etc.) or remediating/addressing a legacy impact caused by a previous economic activity, thereby reducing the pressure and achieving measureable and demonstrable conservation outcomes.

This is only applicable if:

- The economic activity or measure has an effect of net reduction of the pressure already exerted by an existing activity.
- An adaptive management system based on a monitoring plan is in place to verify reduction of pressure over time.
- The impact/damage that is being mitigated happened before the remediation activity (with a clear reference to the baseline period and baseline condition)[72] and is not directly related to it
- The mitigation activity is not required by law

SC 4 – Enabling activities

Some activities may substantially contribute by **enabling other activities** to make a substantial contribution. Examples of such enablers can be monitoring solutions, advisory services or manufacture of environmental-friendly agriculture inputs.

Summary figure

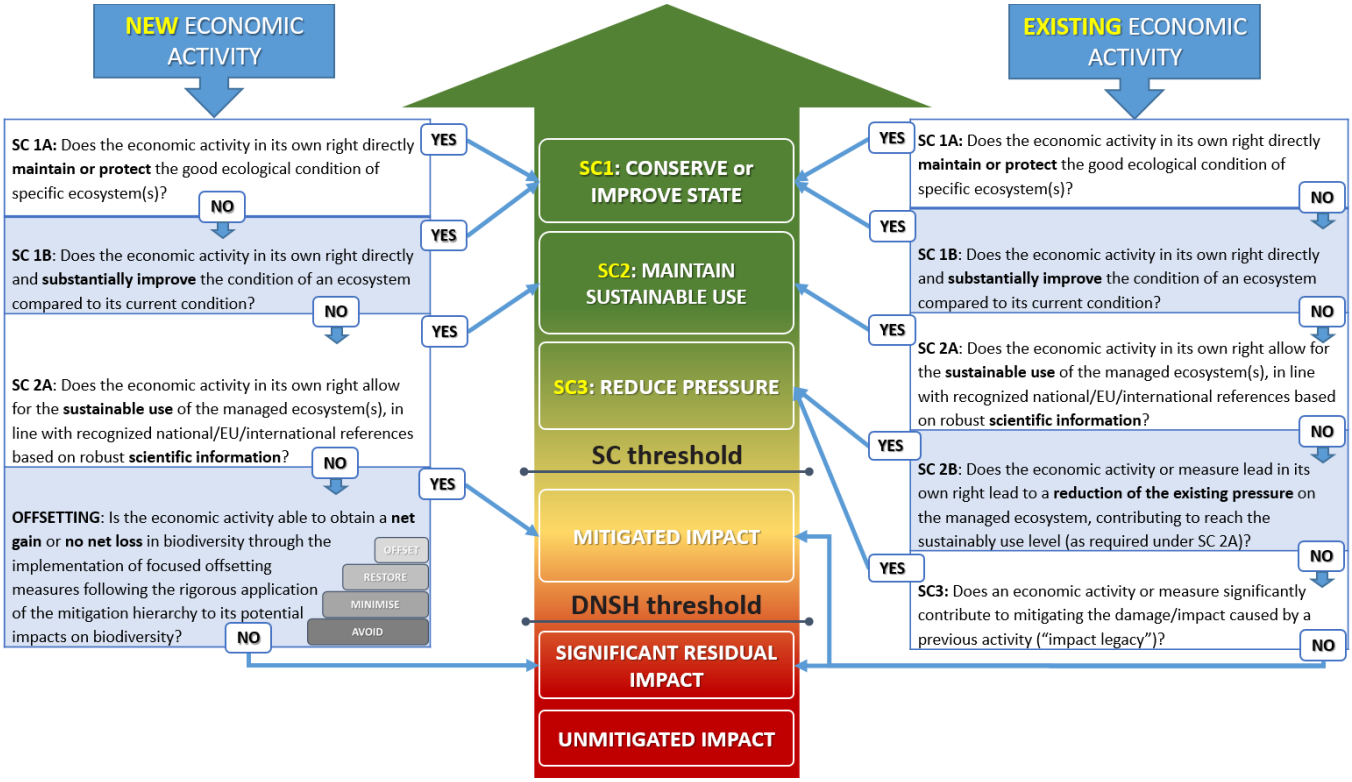
Figure 10 acts as a guide to understanding how and where the Taxonomy supports the protection and restoration of biodiversity and ecosystems, and where it does not. It includes a stepwise process for both new and existing activities to assess which types of substantial contribution the activity can deliver.

[70] CBD 'Comment on Baselines for SBSTTA 24 Item 3'

[71] The EU Guidance on Integrating Ecosystems and their Services into Decision-Making Summary for Policymakers in Government and Industry adopted by the European Commission also explicitly discusses the mitigation hierarchy and conditions applicable to mitigation activities. https://ec.europa.eu/environment/nature/ecosystems/pdf/8461_Summary%20_EU_Guidance_Draft_02_17.07.2020.pdf

[72] For guidance on baseline condition and period, please refer to the 'Comment on Baselines for SBSTTA 24 Item 3'

Figure 10: Conceptual view of how an existing or new economic activity can contribute to the biodiversity and ecosystems objective, based on figure as included in the Platform on Sustainable Finance's draft recommendations[73].



Reference points to set the level of ambition

Annex A.4 provides a non-exhaustive listing of EU policies and targets relative to Biodiversity and Ecosystems. These elements can be used as points of reference when establishing the level of ambition corresponding to the substantial contribution.

Some thinking has been developed on the use of Ecosystem Service accounting to set the level of ambition[74]. The use of ecosystem services flows (generation of biomass, pollination, removal of pollutants from air, soil and water, natural protection from floods, etc.) directly depends on the ecological status and condition of ecosystems. An assessment of ecosystem services (ES) potential (what the ecosystem is able to provide) and ES demand (what the economy, or other natural systems need) can highlight match and mismatch between ES potential and demand. When ES demand > ES potential, there is an unsustainability that can be repaired either by reducing the ES demand, either by increasing the ES potential.

[73] https://ec.europa.eu/info/publications/210803-sustainable-finance-platform-technical-screening-criteria-taxonomy-report_en

[74] See Annex B How could we set the level of ambition using Ecosystem Service accounting by Alessandra La Notte

Further considerations

The specific case of offsetting[75]

Offsetting is the process or practice of compensating for an impact incurred by a particular activity, by implementing another activity that helps to mitigate that same impact. It is not the process of substitution with a cleaner activity. It is an add-on as compensation to an activity that is not providing a direct substantial contribution to an environmental objective.

- Compensation takes place in the same area/ecosystem where the activity is causing a pressure;
- Offsetting can take place in another location, which, from a biodiversity point of view is problematic as ecosystems have different tipping points and pressures cannot be compensated or 'exchanged' across ecosystems (unlike climate).

In the biodiversity context, the Business and Biodiversity Offsets Programme (BBOP), an international collaboration for the development of offset methodologies, defines biodiversity offsets as 'the measurable conservation outcomes resulting from actions designed to compensate for significant residual adverse biodiversity impacts arising from project development after appropriate prevention and mitigation measures have been taken. The goal of biodiversity offsets is to achieve no net loss and preferably a net gain of biodiversity on the ground with respect to species composition, habitat structure, ecosystem function and people's use and cultural values associated with biodiversity'[76].

Two examples:

- In the context of climate mitigation where emissions caused by one activity are offset by paying for the implementation of an activity which reduces GHG emissions (the purchasing of offsets).
- In the context of biodiversity and ecosystem management where the degradation, loss or destruction of a habitat or ecosystem is offset by the restoration of habitat or an ecosystem in another location.

There are various reasons that make the use offsetting inappropriate as a means to deliver substantial contribution to an environmental objective in the Taxonomy.

1. **Offsetting was not considered suitable for the climate mitigation objective, which sets precedence for consistency in the Taxonomy**. For Climate Mitigation and Adaptation, the Technical Expert Group (TEG) who supported the Commission in the development of the first Delegated Act of the Taxonomy, considered that offsetting was not an appropriate means by which an activity could contribute substantially to the stabilisation of greenhouse gas emissions. Equally offsetting would not enable the economic activity to be consistent with the long-term temperature goal of the Paris Agreement unless compensated emissions were higher than those caused by the activity and were achieved within the same year/short term time period of the activity – i.e. no lag-time. This sets a clear precedent for the relevance of offsets in the definition of substantial contribution to the other environmental objectives of the Taxonomy.
2. **Offsetting as an approach is the last step of the mitigation hierarchy, after harm has taken place**. The mitigation hierarchy is a corner stone of impact assessment and is routinely applied in the context of Environmental Impact Assessment (EIA) to reduce the potential impact of projects. The practice is embedded and clearly mentioned in the EIA Directive[77] and the Habitats

[75] Sub-section as included the Platform on Sustainable Finance's draft recommendations report https://ec.europa.eu/info/publications/210803-sustainable-finance-platform-technical-screening-criteria-taxonomy-report_en

[76] Business and Biodiversity Offsets Programme (BBOP): Biodiversity Offset Design Handbook | BES-Net (besnet.world)

[77] Directive 2014/52/EU, Art.5, para 1: *´Where an environmental impact assessment is required, the developer shall prepare and submit an environmental impact assessment report. The information to be provided by the developer shall include at least: ….. (c) a description of the features of the project and/or measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment ´.*

Directive. In addition, it is widely applied in financial institutions (not least because observing the hierarchy is required by IFC performance standard 6, EIB Standard 3, EBRD PR 6, WB ESS)[78]. In the mitigation hierarchy, offsets are the last resort set of measures in the series of essential sequential steps that must be taken to limit any negative impacts on biodiversity. Therefore, it seems obvious to associate the application of the mitigation hierarchy to a DNSH requirement and, as such, not sufficient to determine a SC[79].

3. **Offsetting activities are separate and distinct from impacting activities and are separated in the Taxonomy NACE structure**. Offsetting is, by its very nature, the recognition that an impact will occur through the implementation or operation of that activity, and cannot be avoided. Thus, in order for the impact to 'net out', it needs to be countered by another activity that takes place elsewhere (i.e. the offset). In the context of the Taxonomy, this creates a separation between an activity that causes the impact and an activity that causes the improvement[80]. The Taxonomy technical screening criteria are developed at the economic activity level. The Taxonomy avoids taking any stance on aggregate performance whether at company, objective or sector level, even if in practice the implementation of multiple economic activities may be carried out by a single entity. In Taxonomy terms then the impacting economic activity cannot provide a substantial contribution to an objective through the activities of another offsetting economic activity. For the offsets to be 'taxonomy compliant', they in and of themselves need to be in compliance with the taxonomy for the offsetting activity. Other economic activities are evaluated against their own criteria.

4. **Offsetting processes are not guaranteed to remediate residual impacts caused by harmful activities**[81]. Specific limitations on the adoption of offsets to achieving no net loss or net gain of biodiversity and ecosystem services are spelled out in the OECD report on offsetting[82]. Compared to other instruments for biodiversity conservation and sustainable use, most biodiversity offset schemes are still fairly nascent in their application, and there is much to be learned from existing experience. The evidence available to date points to somewhat mixed results in terms of the environmental effectiveness of existing biodiversity offset schemes[83].

It is important to note that conservation or restoration activities have a rightful place in the Taxonomy as economic activities that, subject to specific TSC, make a substantial contribution to biodiversity. In some cases, conservation and/or restoration are financed by companies or investors as a means of offsetting an impact on biodiversity occurring as a result of another economic activity. As the Taxonomy Regulation supports the flow of green finance, it is appropriate to consider the relationship between the funder and the biodiversity enhancing activity – i.e. whether the conservation or restoration activity is taking place in isolation, or whether it is being financed as a result of a company seeking to offset their impact. In the latter case, the company causing the impact can still not claim SC for the impacting activity through offsetting, for the afore-mentioned reasons. But the context in which the activity is taking place remains important in deciding whether or not a substantial contribution is being delivered compared to the counterfactual.

In conclusion, the following practical considerations can be made for the development of TSC:

[78] International Finance Corporation's Guidance Note 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources. January 1 , 2021 (updated June 27, 2019), p.10-11.

[79] More recently, an EU Guidance on Integrating Ecosystems and their Services into Decision-Making Summary for Policymakers in Government and Industry has been adopted by the European Commission. https://ec.europa.eu/environment/nature/ecosystems/pdf/8461_Summary%20_EU_Guidance_Draft_02_17.07.2020.pdf

[80] For example the generation of coal-fired power releasing significant GHG emissions being offset through the planting of trees. The two activities are (impacting) coal fired power generation, and (offsetting) the planting of trees – afforestation.

[81] https://zslpublications.onlinelibrary.wiley.com/doi/full/10.1111/acv.12173

[82] This information is from the 'Policy highlights paper', which draws on this full report: OECD (2016), Biodiversity Offsets: Effective Design and Implementation, OECD Publishing, Paris. http://dx.doi.org/10.1787/9789264222519-en

[83] Tucker, G.M., Quétier, F. & Wende, W. (2020) Guidance on achieving no net loss or net gain of biodiversity and ecosystem services. Report to the European Commission, DG Environment on Contract ENV.B.2/SER/2016/0018, IEEP,Brussels. https://ec.europa.eu/environment/nature/biodiversity/nnl/pdf/NNL%20Guidance%20-%20July%202020%20-%20Final.pdf

1. **If an economic activity causes significant harm, it cannot be considered Taxonomy aligned (Art. 3b TR), or seek alignment through offsetting**. Because a) significant harm has occurred; b) the offsetting activity is almost always different from the economic activity which has caused harm[84]. In this case, reference to offsetting should be limited to the scope of DNSH technical criteria, when embedded in the existing legal framework.

2. Activities like conservation or restoration of ecosystems have a rightful place in the Taxonomy as economic activities that, subject to specific technical screening criteria, make a substantial contribution to biodiversity and ecosystems. Nevertheless, when conservation and/or restoration are implemented with the purpose of offsetting they can only be counted as DNSH and have to fulfil the following conditions, which should form part of the technical screening criteria for DNSH:

- The offsetting activity has explicitly committed to, and includes the practices necessary to obtain **net gain** of biodiversity in areas with high biodiversity value, including (i) habitat of significant importance to Critically Endangered and/or Endangered species[85]; (ii) habitat of significant importance to endemic and/or restricted-range species; (iii) habitat supporting globally significant concentrations of migratory species and/or congregatory species; (iv) highly threatened and/or unique ecosystems; and/or (v) areas associated with key evolutionary processes[86].
- The offsetting activity has explicitly committed to, and includes the practices necessary to obtain **no net loss** of biodiversity in all other areas, unless the specific national legislation requires ´net gain´.
- The offsetting activity has to lead to ecological equivalence and be additional, permanent, verifiable, enforceable and transaction costs need to be reasonable[87].

What is the impact of excluding offsetting as substantial contribution from the Taxonomy?[88]

Some particularly harmful economic activities will not be able to claim substantial contribution to biodiversity and ecosystems, as the application of the mitigation hierarchy at any level (including offsetting) can only lead to compliance with DNSH criteria. This should be acknowledged and explained on an activity-by-activity basis.

This does not preclude companies, which are investing in or generating their turnover from offsetting activities to be recognised under the Taxonomy, but they may also find that some parts of their investments cannot be taxonomy aligned as they cause significant harm. Reporting at the economic activity level ensures that both good and harmful activities can be identified.

How that translates into actual decision making in relation to the rating and financing of, or investment in, a company, is in no way precluded by the taxonomy and its differentiated (rather than aggregated net approach, as suggested by an application of offsets to the definition of substantial contribution) consideration of individual activities. As a transparency instrument, the taxonomy merely provides the basis for defining the share of a company's activities considered significantly harmful (i.e. as per the current definition of the taxonomy as falling below the DNSH threshold), significantly contributing and in-between (notwithstanding further developments of the taxonomy in terms of the

[84] As an example, mining as an activity cannot deliver an SC to biodiversity as it is directly impactful. Nevertheless, a 'mining company' may own land, assets, or invest in another economic activity which can deliver SC to biodiversity, such as a restoration activity somewhere else on their site, or at the end of the life of the mine. This does not make the economic activity of mining taxonomy aligned by extension.

[85] As listed on the International Union for the Conservation of Nature (IUCN) Red List of Threatened Species. IUCN Red List of Threatened Species

[86] These criteria are adopted in the IFC Performance Standards (PS6 - Biodiversity Conservation and Sustainable Management of Living Natural Resources- 2012 version) and commonly used for biodiversity impact assessment.

[87] OECD (2016): Biodiversity Offsets Effective design and implementation https://www.oecd.org/environment/resources/Policy-Highlights-Biodiversity-Offsets-web.pdf

[88] Sub-section as included the Platform on Sustainable Finance's draft recommendations report https://ec.europa.eu/info/publications/210803-sustainable-finance-platform-technical-screening-criteria-taxonomy-report_en

ongoing work of Platform on Sustainable Finance's subgroup 3 exploring the scope for developing a significantly harmful and a no significant impact taxonomy).

Other considerations

It might be interesting to consider the types of activities which might count as enabling for the protection and restoration of biodiversity and ecosystems. Could food processing be integrated within the taxonomy as enabling if their suppliers make a substantial contribution when producing the raw materials? These activities can indirectly influence the adoption of better practices upstream through their high potential leverage, making a substantial contribution to the biodiversity and ecosystems. However, it would be more difficult to trace and verify in a robust way. Furthermore, there is a risk of channelling green investments towards indirect actors to the detriment of direct positive contributors.

Quantitative approaches require measurement of relevant metrics (possible proxies). The measurement of such metrics should be done in a cost-effective manner to avoid adding a burden to the operators. Availability of affordable and robust indicators will be key in the selection of the approach.

H. Horizontal considerations

Linkages and overlaps between the environmental objectives

An individual activity may have substantial environmental impacts, pressures or reduction potential across several objectives, hence it may potentially contribute to multiple objectives. An example could be 'wastewater treatment'. An economic activity within this sector contributes to the water objective (SC type 3: An activity dealing with pressures from other activities) as well as to the pollution objective (SC type 1: reducing direct emissions of pollutants). Thus, substantial contribution criteria for this activity could appear under both environmental objectives. This is likely to be the case for a large number of activities.

The Taxonomy Regulation accounts for this possibility by stipulating that activities have to make a substantial contribution to at least one environmental objective (and do no significant harm to any of the others) in order to be considered environmentally sustainable. However, the regulation does not require an activity to substantially contribute to more than one objective. For example, an activity within the sector 'wastewater treatment' cannot be required to make a SC to the water objective *and* to the pollution objective in order to be considered taxonomy-aligned. However, one may need to avoid a situation where an activity is considered taxonomy-aligned because of substantial contribution to one objective, while the main impact, of the activity (where a substantial contribution would be more important) relates to another objective. For example, an activity involving fuel combustion may achieve a substantially reduced water use (by adopting certain types of cooling systems) but most of its impact may be associated with emissions of pollutants to air and it may be considered inappropriate to reward such activity for a reduced water use.

This situation requires careful consideration. On the one hand, those activities may be particularly interesting to include as they have the potential to substantially contribute to several objectives at once (win-win situation). On the other hand, criteria development should take this specificity into account to ensure it is not at the expense of the environmental ambition and integrity for each objective.

A possible way forward could consist of developing criteria for a sector across relevant objectives, instead of developing criteria for each sector considered under the water objective, then criteria for each sector under the pollution objective. Developing in parallel and in a coordinated way the SC criteria for each of the relevant objectives for a given economic activity would allow:

- Fine-tuning the level of ambition for that specific economic activity and only including an activity for substantial contribution to an objective if that objective is a priority area of environmental impact for the individual activity. This would avoid that economic operators carrying out that activity focus on a less relevant objective.
- Developing at the same time the full package of substantial contribution and do-no-significant-harm criteria in a consistent way.

However, such an approach needs to be implemented very carefully to ensure a level playing field within one objective across activities.

Different types of SC to one objective – cumulative or alternative requirements?

If making SC to an objective can be split between several independent types of potential significant contribution, how can substantial contribution to this objective be defined? There are three options:

a. Criteria define performance requirements that reflect all applicable types of SC (restrictive view)

   E.g. for the sector 'manufacturing of iron and steel', criteria defining SC include requirements reflecting SC by Circular Design and Production, SC by Circular Use, SC by Circular Value Recovery *and* SC by Circular Support.

b. SC to one type of contribution is enough, as long as minimum requirements are met for the other applicable types of contribution (intermediate view)

   E.g. Criteria defining SC include requirements reflecting SC by Circular Use (e.g. durability), as well as minimum requirements for Circular Design and Production (e.g. by-products of activity should be recycled, min share of secondary raw material).

c. SC to one type of contribution is enough, regardless of the other types of contribution (lenient view)

   E.g. Criteria defining SC only include requirements reflecting SC by Circular Use (e.g. durability) with no requirement on the other relevant aspects of circular economy.

The three options just outlined are presented graphically in the table below:

Table 14: Different types of SC to one objective

		Type 1 contribution		
		Negative	Acceptable	Substantial
Type 2 contribution	Negative	Not aligned	Not aligned	Aligned if option C
	Acceptable	Not aligned	Not aligned	Aligned if option B or C
	Substantial	Aligned if option C	Aligned if option B or C	Aligned for each option A, B or C

The limit between Negative and Acceptable contribution (see table above) can be DNSH criteria level (broadly equivalent to minimum [EU] legal requirements level) while the limit between Acceptable and Substantial contribution can be SC criteria level.

The following table outlines pros and cons of the three options to define substantial contribution:

Table 15: Pros and cons of each option

Option A	Pros	➢ Only deep green activities, robust
	Cons	➢ Very restrictive, would exclude many activities significantly contributing in one direction while having acceptable contribution on the other directions ➢ Hence, non-level playing field with climate objective ➢ Potentially poor usability – even an activity which makes a contribution across all types would have to show compliance with each set of criteria defined under each type of SC
Option B	Pros	➢ Filters out negative contributors ➢ Possibility to set ambitious levels of what is deemed acceptable ➢ Similar approach than the whole taxonomy methodology (Taxo: SC to one objective + DNSH to all the others // Here: SC to one sub-objective + DNSH to all the others)
	Cons	➢ Need to define DNSH level per type of contribution
Option C	Pros	➢ Easy to assess
	Cons	➢ May be too generous, i.e. risk to include activities with bad performances in some areas related to the objective chosen

An alternative approach would be to select for each activity which of the substantial contribution types are relevant and require a substantial contribution level for all of them, but not for those that may have less relevance. However, this method is only possible if sector-specific criteria are developed, while some approaches are based on overarching criteria (applicable, across sectors).

Non-market activities

Across the objectives, several activities can be considered to make a substantial contribution *without* generating revenues: clean-up operations, restoration or preservation projects, awareness campaigns, etc. These activities can be very important for several objectives, and there is often no revenue generating equivalent that performs the same service.

However, these activities are not activities that would be part of the investment universe of an asset manager. They are nevertheless fundable (public spending, NGOs or foundations). Inclusion of such activities is even more important if the taxonomy is to be used by the public sector (e.g. in the framework of the post-COVID19 stimulus packages).

Potential horizontal reference to manufacturing/provision of EU Ecolabel products (goods and services)

There could be a horizontal reference to EU Ecolabel products (goods and services). Manufacturing of labelled products would automatically be considered as a taxonomy-aligned activity, as would services having obtained the EU Ecolabel (e.g. tourist accommodation). However, a horizontal reference may not fit in the taxonomy framework and they should still be classified to define to which objective they make a SC. This may need to be assessed on a case-by-case basis.

Interactions with other criteria for the same activity (but possibly considered lower priority since EU Ecolabel criteria already exist) would need to be considered carefully.

To be noted that setting certain SC criteria (i.e. product certification and labelling) may disadvantage SMEs and in particular start-ups, which do not have the same capacities and financial resources as large companies (level playing field issue).

Verification

The Taxonomy Regulation does not explicitly require any formal verification of whether activities comply with the technical screening criteria and minimum safeguards of the EU taxonomy. However, national supervisors will monitor compliance by financial market participants with the taxonomy disclosure obligations. In addition, following good practice, financial market participants are encouraged to seek external assurance on their taxonomy-related disclosures. Companies that fall under the scope of the Non-Financial Reporting Directive (NFRD) must make the relevant taxonomy disclosures as part of their non-financial statements, which does not, as a baseline, require verification (although this might be different based on the transposition by Member States).

However, it has to be acknowledged that verification, in other words who makes a judgment on whether qualitative criteria are complied with, remains a challenge for the markets.

Unless the verification framework is defined, it is difficult to set appropriate criteria: qualitative criteria require some judgment, but leaving such judgment to the economic operator or the investor raises a conflict of interest. In fact, for instance, asset managers and issuers may also have an incentive at applying the criteria mildly in order to increase the share of taxonomy-alignment.

Public authorities or development banks may have much bigger capacity than asset managers for checking compliance with detailed criteria. This means that for non-revenue generating activities (that will be primarily financed by public authorities), more detailed criteria could be acceptable from a usability perspective.

Incremental vs transformational changes

Improvement towards the environmental objective can be either incremental or transformational. An incremental change induces a progress of the activities but no paradigm change (e.g. improving the efficiency of a process to reduce its impact, without changing the process), while a transformational one induces a strong swift within or outside the activity. Three categories of transformational change are identified:

- **Process innovation** (e.g. a car manufacturer switches its activity from diesel to EV manufacturing. A farmer changes the type of fertilizer spread on its fields, a plastic manufacturer that switch from fossil-based and/or carbon-intensive feedstock and products towards bio-based ones). Here, the change is not an incremental improvement of the current process, but a disruptive way to provide a similar output (a car, some food, plastic material) for the same activity operator.
- **Business Model innovation** (e.g. a sharing platform providing a product-as-a-service like car rental). The difference comes from the fact that the same service can be offered by a different operator or a different activity.
- **Lifestyle change** (e.g. stop eating meat). Despite its strong potential for reducing the impact, this is not an economic activity and should be considered outside the scope of the taxonomy work.

I. Conclusions

This work builds on the JRC report defining substantial contribution to climate change mitigation[89] by presenting seven possible approaches to set internationally-applicable technical screening criteria, and describing the different types of substantial contribution that an economic activity can make to the following EU taxonomy environmental objectives: the sustainable use and protection of water and marine resources; the transition to a circular economy; pollution prevention and control; the protection and restoration of biodiversity and ecosystems. The report is one of the first attempts to define a methodology for establishing environmental performance thresholds for these environmental objectives at economic activity level that can be used for sustainable finance purposes. Given that addressing these environmental objectives in sustianable finance is less well-established than addressing climate change, the findings and suggestions made in this report should be seen as part of continuing developments in this space, notably through the work of the Platform on Sustainable Finance, and are subject to updates.

Further methodological and conceptual work might consider how to assess the link between an individual technical screening criteria and the desired headline level of ambition, as well as developing specific aspects such as how to consider enabling activities or a methodology to define do no significant harm (DNSH) technical screening criteria. Another possible development would be analysing whether and how this methodology could apply to other sustainable finance taxonomies beyond the EU taxonomy.

[89] Canfora et al, 2021, Substantial contribution to climate change mitigation – a framework to define technical screening criteria for the EU taxonomy, https://publications.jrc.ec.europa.eu/repository/handle/JRC123355?mode=full

Glossary

Frequently used concepts

Table 16: Frequently used concepts' definitions

Concept	Definition
Approach to define substantial contribution	One of the ways to define in **technical screening criteria** whether an **economic activity** contributes substantially to the realisation of an environmental **objective**. *See section C.3/C4*
Baseline	Point of comparison used when assessing the contribution of an activity. The baseline is the likely alternative scenario if the assessed activity was *not* carried out (e.g. another activity with similar output would be carried out instead). Note that the baseline is not necessary explicit and can be prospective. *See section C.2*
Economic activity	In this report, 'economic activity' may refer to two different concepts: - A **specific** (economic) **activity** is characterised by an input of resources, a production process and an output of products (goods or services). It is carried out by a given economic operator in a specific location (e.g. operation of the Grande Dixence Dam in Switzerland) Swiss dam. - A **generic** (economic) **activity** is a grouping of activities with similar characteristics (e.g. 'Production of electricity from hydropower'). As such, a specific activity is an embodiment of a generic activity. In the taxonomy, the criteria are developed at generic activity level, and the specific activities have to comply with the criteria to be eligible. See section B2.1 for more information.
Impact	The impact is the result of the **pressures** exerted (e.g. emission of pollutants, abstraction of water) by an economic activity on a given **state of the environment** (e.g. state of water body, vegetation). Examples of impact would be biodiversity loss, environmental damage).[90]
Level of Ambition	Level of stringency an activity has to achieve to demonstrate that its contribution is substantial. Depending on the **approach** selected to define a **Technical Screening Criteria,** the level of ambition can be set in a quantitative way (e.g. a more or less challenging threshold to reach) or in a qualitative way (e.g. a more or less demanding practice to implement). *See section C.5*

[90] From the causal framework DPSIR (Drivers, Pressures, States, Impacts, Responses) for describing the interactions between society and the environment used by the EEA.

Objective	One of the 6 environmental objectives as defined in Article 9 of the Taxonomy Regulation. *See section B.2.2.*
Pressure	See 'Impact'
State of the environment	See 'Impact'
Technical Screening Criteria ('TSC' also 'Criteria')	Determine under which conditions a **specific economic activity** is considered to substantially contribute and not to cause significant harm to an environmental objective. TSC are defined for a given **generic activity**. Specific activities may or may not comply with the criteria. For instance, 'Facilities operate at life cycle emissions lower than 100gCO_2e/kWh' is a requirement that forms part of the TSC (substantial contribution aspect) defined for the generic activity 'Production of electricity from hydropower'. Those specific activities producing electricity from hydropower but not complying with this requirement will not be considered to make a substantial contribution. A TSC is built on an **approach** and a **level of ambition**: the level of ambition characterises the stringency while the approach characterises the way to develop and assess the criteria.
Type of Substantial Contribution ('SC Type')	Ways for an activity to substantially contribute to a given objective. *See section C.2* defining three main SC Types: an activity can contribute by directly improving **the state of the environment** (e.g. sequestrating carbon from the atmosphere), or by reducing the **pressure** on the environment compared to the **baseline** (e.g. emitting less GHG than the likely alternative), or by enabling one of the two previous types (e.g. manufacturing components necessary to perform the previous activities).

List of abbreviations

BAU: Business As Usual

CE: Circular Economy

DG: Directorate-General

DNSH: Do Not Significantly Harm

EEA: European Environment Agency

EIB: European Investment Bank

ES: Ecosystem Service

GHG: Greenhouse gas

kWh: kilowatt-hour

IPBES: Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services

IPCC: Intergovernmental Panel on Climate Change

LCA: Life-cycle assessment

MRF: Material Recovery Facility

NFRD: Non-Financial Reporting Directive (Directive 2014/95/EU)

SC: Substantial Contribution

TEG: Technical Expert Group on Sustainable Finance

TR: Taxonomy Regulation

TSC: Technical Screening Criteria

WFD: Water Framework Directive

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Annex A.1: Listing of EU policies and targets – Sustainable use and protection of water and marine resources[91]

Name of the policy	Policy objective / target
Water Framework Directive (WFD)[92]	It establishes a framework for the protection of inland surface waters, transitional waters, coastal waters and groundwater, with the objective to achieve and maintain Good Ecological Status or Potential and Good Chemical Status of surface waters and Good Quantitative Status and Good Chemical Status of groundwaters.
Marine Strategy Framework Directive (MSFD)[93]	The ambition is to achieve Good Environmental Status (GES) of EU marine waters, GES is defined as 'The environmental status of marine waters where these provide ecologically diverse and dynamic oceans and seas which are clean, healthy and productive'. To better understand it, one can refer to the 11 descriptors defined in the Annex I of each Directive. For example: Non-indigenous species introduced by human activities are at levels that do not adversely alter the ecosystems
Biodiversity Strategy for 2030[94]	It aims to put Europe's biodiversity on a path to recovery by 2030 with benefits for people, the climate and the planet. It is also the proposal for the EU contribution to the upcoming international negotiations on the global post-2020 biodiversity framework. The Biodiversity Strategy aims is to build our societies' resilience to future threats such as climate change impacts, forest fires, food insecurity or disease outbreaks, including by protecting wildlife and fighting illegal wildlife trade. For example: By 2030, protect 30% of the EU's land and 30% of the EU's sea area and integrate ecological corridors, as part of a true Trans-European Nature Network.
Sustainable Development Goals 'Life Below Water' (SDG 14)	The ambition is to sustainably manage and protect marine and coastal ecosystems from pollution, as well as address the impacts of ocean acidification. For example: By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution
Sustainable Development Goals 'Ensure availability and sustainable management of water and	Its aim is to ensure access to drinking water and basic sanitation, to include the management of water and wastewater and ecosystems, across boundaries of all kinds. For example: By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and

[91] Disclaimer: this listing doesn't pretend to be exhaustive

[92] Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy

[93] Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy

[94] EU Biodiversity Strategy for 2030 Bringing nature back into our lives. COM 2020/380 final.

sanitation for all' (SDG 6)	materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally
Common Fisheries Policy (CFP)[95]	It ensures that fishing and aquaculture are environmentally, economically and socially sustainable and that they provide a source of healthy food for EU citizens.
Maritime Spatial Planning Directive (MSP)[96]	It highlights the need to manage EU waters more coherently, and working across borders and sectors to ensure that human activities at sea take place in an efficient, safe and sustainable way
8th Environmental Action Programme (8th EAP)[97]	The proposal supports the environment and climate action objectives of the **European Green Deal**. It provides an opportunity for the EU as a whole to reiterate our commitment to the 7th EAP's **2050 vision**: it want to ensure wellbeing for all, while staying within the planetary boundaries. The 8th Environment Action Programme will guide European environmental policy until 2030
Habitat and Bird Directives (HBD)[98]	In particular for several marine habitats and species and the implementation of protective measures that ensure their conservation status
Bathing Water Directive (BWD)[99]	It aims is to preserve, protect and improve the quality of the environment and to protect human health by adopting adequate containment measures in the release of microorganisms in marine-coastal waters
Drinking Water Directive[100]	It concerns the quality of water intended for human consumption. Its objective is to protect human health from adverse effects of any contamination of water intended for human consumption by ensuring that it is wholesome and clean.
Urban Waste Water Treatment Directive (UWWTD)[101]	It has a role to play in steering the EU towards the ambition of zero pollution proclaimed in the European Green Deal. The UWWTD is a 'basic measure' under the Water Framework Directive(WFD). It plays a significant role in improving the status of bodies of water in the EU, improving the resilience of ecosystems and protecting biodiversity. In view of the significant challenge to ensure good status for the EU's bodies of water by latest 2027, effective collection and treatment of urban waste water is very important.
Groundwater Directive (GWD)[102]	The GWD provides EU-wide groundwater quality standards for nitrates and pesticides, (individual and total, in Annex I). For other pollutants putting groundwater bodies at risk of failing to meet good chemical status, MS have

[95] Regulation (EU) No 1380/2013 of the European Parliament and of the Council of the 11 December 2013 on the Common Fisheries Policy
[96] Directive 2014/89/EU of the European Parliament and of the Council of 23 July 2014 establishing a framework for maritime spatial planning
[97] https://ec.europa.eu/environment/pdf/8EAP/2020/10/8EAP-draft.pdf
[98] Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora
[99] Directive 2006/7/EC of the European Parliament and of the Council of 15 February 2006 concerning the management of bathing water quality and repealing Directive 76/160/EEC
[100] Council Directive 98/83/EC of 3 November 1998 on the quality of water intended for human consumption
[101] Council Directive 91/271/EEC of 21 May 1991 concerning urban waste-water treatment
[102] Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the protection of groundwater against pollution and deterioration

	to set their own threshold values taking into account identified risks and the minimum list of pollutants in the Annex II.
Floods Directive[103]	The main objective is to reduce and manage the risks that floods pose to human health, the environment, cultural heritage and economic activity. In this way, it complements the WFD. The Floods Directive covers river floods, flash floods, urban floods, sewer floods and coastal floods.
Environmental Quality Standards Directive [104] **(linked to WFD)**	It sets harmonised environmental quality standards for surface waters for 45 'priority substances' and eight other pollutants and includes a requirement to phase out discharges, emissions and losses of 21 'priority hazardous substances' within 20 years. Priority hazardous substances are defined as 'substances or groups of substances that are toxic, persistent and liable to bio-accumulate, and other substances or groups of substances which give rise to an equivalent level of concern'. The 45 priority substances include industrial chemicals, plant protection products, biocides, metals (such as mercury and cadmium) and other groups like polyaromatic hydrocarbons (mainly incineration by-products) and polybrominated biphenylethers (used as flame retardants).
A Blueprint to Safeguard Europe's Water Resources[105]	The 'Blueprint' outlines actions that concentrate on better implementation of current water legislation, integration of water policy objectives into other policies, and filling the gaps in particular as regards water quantity and efficiency. The objective is to ensure that a sufficient quantity of good quality water is available for people's needs, the economy and the environment throughout the EU.
Strategic Approach to Pharmaceuticals in the Environment[106]	The Approach includes several actions aimed at minimising the emission of pharmaceuticals to the environment and their impacts on the environment and on human health via the environment
Nitrates Directive[107]	It aims to protect water quality across Europe by preventing nitrates from agricultural sources polluting ground and surface waters and by promoting the use of good farming practices.
Integrated Maritime Policy and 'Blue growth/economy' initiative	The integrated maritime policy seeks to provide a more coherent approach to maritime issues, with increased coordination between different policy areas. Blue growth is the long term strategy to support sustainable growth in the marine and maritime sectors as a whole. Seas and oceans are drivers for the European economy and have great potential for innovation and growth. It is the maritime contribution to achieving the goals of the Europe 2020 strategy for smart, sustainable and inclusive growth.
Farm-to-Fork Strategy 2020	The EU 2020 Farm to Fork Strategy aims to ensure sustainable food production, ensure food security, stimulate sustainable food processing, wholesale, retail, hospitality and food services practices, promote sustainable

[103] Directive 2007/60/EC of the European Parliament and of the Council of 23 October 2007 on the assessment and management of flood risks

[104] Directive 2008/105/EC of the European Parliament and of the Council of 16 December 2008 on environmental quality standards in the field of water policy, amending and subsequently repealing Council Directives 82/176/EEC, 83/513/EEC, 84/156/EEC, 84/491/EEC, 86/280/EEC and amending Directive 2000/60/EC of the European Parliament and of the Council, as amended by Directive 2013/39/EC.

[105] The blueprint to Safeguard Europe's Water resources - Communication from the Commission (COM(2012)673

[106] https://ec.europa.eu/environment/water/water-dangersub/pdf/strategic_approach_pharmaceuticals_env.PDF

[107] Council Directive of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources (91/676/EEC)

	food consumption and facilitating the shift to healthy, sustainable diets, reduce food loss and waste, combat food fraud along the food supply chain, enable and promote the transition.
Industrial Emissions Directive (IED)[108]	It aims to achieve a high level of protection of human health and the environment taken as a whole by reducing harmful industrial emissions across the EU, in particular through better application of Best Available Techniques (BAT). Around 50,000 installations undertaking the industrial activities listed in Annex I of the IED are required to operate in accordance with a permit (granted by the authorities in the Member States). This permit should contain conditions set in accordance with the principles and provisions of the IED.
EPRTR Regulation[109]	The European Pollutant Release and Transfer Register (E-PRTR) provides access to information from some 24,000 industrial facilities concerning the annual amounts of pollutants released to air, water and land, as well as off-site transfers of waste and of pollutants in waste water.
Chemicals strategy[110]	It is part of the EU's zero pollution ambition, which is a key commitment of the European Green Deal. The EU's chemicals strategy aims to better protect citizens and the environment and boost innovation for safe and sustainable chemicals

[108] [108] Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control)

[109] Regulation (EC) No 166/2006 of the European Parliament and of the Council of 18 January 2006 concerning the establishment of a European Pollutant Release and Transfer Register and amending Council Directives 91/689/EEC and 96/61/EC

[110] Chemicals Strategy for Sustainability. Towards a Toxic-Free Environment

Annex A.2: Listing of EU policies and targets – Transition to a circular economy[111]

Name of the policy	Policy objective / target
A new Circular Economy Action Plan[112]	Follows the 2015 first Circular Economy Action Plan (54 actions). The European Commission plans to propose measures along the entire life cycle of products, targeting for example their design, promoting circular economy processes, fostering sustainable consumption, and aiming to ensure that the resources used are kept in the EU economy for as long as possible.. This includes for instance to establish a right to repair for electronics and ICT.
Waste Framework Directive[113]	The directive sets the basic concepts and definitions related to waste management. It lays down some basic waste management principles and introduces the waste management hierarchy. It introduces the 'polluter pays principle' and the 'extended producer responsibility'. It includes recycling and recovery targets for 2020. For example: By 2030, achieve minimum targets by weight for recycling regarding specific materials contained in packaging waste: (i) 55 % of plastic; (ii) 30% of wood; (iii) 80% of ferrous metal; (iv) 60% of aluminium; (v) 75% of glass; (vi) 85% of paper and cardboard
Directive on end of life vehicles[114]	The directive aims at making dismantling and recycling of ELVs more environmentally friendly. It sets clear quantified targets for reuse, recycling and recovery of the ELVs and their components. It also pushes producers to manufacture new vehicles without hazardous substances (in particular lead, mercury, cadmium and hexavalent chromium), thus promoting the reuse, recyclability and recovery of waste vehicles
WEEE (Waste of electrical and electronic equipment) Directive[115]	The Directive provided for the creation of collection schemes where consumers return their WEEE free of charge. These schemes aim to increase the recycling of WEEE and/or re-use.
Packaging Waste Directive[116]	This Directive lays down measures aimed, as a first priority, at preventing the production of packaging waste and, as additional fundamental principles, at reusing packaging, at recycling and other forms of recovering packaging waste and, hence, at reducing the final disposal of such waste.
EU Strategy for plastics in a circular economy[117]	This strategy provides a list of measures recommended to national authorities and industry to improve the economics and quality of plastics recycling, curb plastic waste and littering, drive investments and innovation towards circular solutions and harness global action.

[111] Disclaimer: this listing doesn't pretend to be exhaustive
[112] https://ec.europa.eu/environment/circular-economy/
[113] https://ec.europa.eu/environment/waste/framework/ and https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32008L0098
[114] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02000L0053-20130611&qid=1405610569066&from=EN
[115] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32012L0019
[116] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:01994L0062-20150526
[117] https://ec.europa.eu/environment/circular-economy/pdf/plastics-strategy-brochure.pdf

Directive on waste batteries and accumulators[118]	This directive establishes specific rules for the collection, treatment, recycling and disposal of waste batteries and accumulators. It seeks to improve the environmental performance of batteries and accumulators.
Directive on the restriction of the use of certain hazardous substances in EEE[119]	The Restriction of Hazardous Substances (RoHS) restricts the use of specific hazardous materials found in electrical and electronic products (EEE).
Single Use Plastics Directive[120]	The European Commission proposed on May 2018 new EU-wide rules to target the 10 single-use plastic products most often found on Europe's beaches and seas, as well as lost and abandoned fishing gear.
Industrial Emissions Directive[121]	The IED aims to achieve a high level of protection of human health and the environment taken as a whole by reducing harmful industrial emissions across the EU, in particular through better application of Best Available Techniques (BAT).
Ecodesign Directive[122]	The ecodesign directive provides consistent EU-wide rules for improving the environmental performance of products, such as household appliances, information and communication technologies or engineering. The directive sets out minimum mandatory requirements for the energy efficiency of these products.
Ecolabel Regulation[123]	The EU Ecolabel may be awarded to products and services which have a lower environmental impact than other products in the same group. The label criteria were devised using scientific data on the whole of a product's life cycle, from product development to disposal.
EPRTR Regulation[124]	The European Pollutant Release and Transfer Register (E-PRTR) provides access to information from some 24,000 industrial facilities concerning the annual amounts of pollutants released to air, water and land, as well as off-site transfers of waste and of pollutants in waste water.

[118] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32006L0066
[119] https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1485526057244&uri=CELEX:52017PC0038
[120] https://eur-lex.europa.eu/eli/dir/2019/904/oj
[121] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32010L0075
[122] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32009L0125
[123] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=LEGISSUM%3Aco0012
[124] Regulation (EC) No 166/2006 of the European Parliament and of the Council of 18 January 2006 concerning the establishment of a European Pollutant Release and Transfer Register and amending Council Directives 91/689/EEC and 96/61/EC

Annex A.3: Listing of EU policies and targets – Pollution prevention and control[125]

Name of the policy	Policy objective / target
Water Framework Directive (WFD)[126]	It establishes a framework for the protection of inland surface waters, transitional waters, coastal waters and groundwater, with the objective to achieve and maintain Good Ecological Status and Good Chemical Status for the coastal and transitional waters
Water Framework Directive (WFD)[127]	It establishes a framework for the protection of inland surface waters, transitional waters, coastal waters and groundwater, with the objective to achieve and maintain Good Ecological Status or Potential and Good Chemical Status of surface waters and Good Quantitative Status and Good Chemical Status of groundwaters.
Marine Strategy Framework Directive (MSFD)[128]	The ambition is to achieve Good Environmental Status (GES) of EU marine waters, GES is defined as 'The environmental status of marine waters where these provide ecologically diverse and dynamic oceans and seas which are clean, healthy and productive'. To better understand it, one can refer to the 11 descriptors defined in the Annex I of each Directive.
Prevention and remedying of environmental damage (ELD) [129]	It sets a framework based on the polluter pays principle to prevent and remedy environmental damage. The polluter pays-principle is set out in the Treaty on the Functioning of the European Union (Article 191(2) TFEU). As the ELD deals with the 'pure ecological damage', it is based on the powers and duties of public authorities ('administrative approach') as distinct from a civil liability system for 'traditional damage' (damage to property, economic loss, personal injury).
The Groundwater Directive (GWD) [130]	The GWD provides EU-wide groundwater quality standards for nitrates and pesticides, (individual and total, in Annex I). For other pollutants putting groundwater bodies at risk of failing to meet good chemical status, MS have to set their own threshold values taking into account identified risks and the minimum list of pollutants in the Annex II.
Ambient air quality and cleaner air for Europe[131]	It establishes air quality objectives, including ambitious, cost-effective targets for improving human health and environmental quality up to 2020. It also specifies ways of assessing these and of taking any corrective action if the standards are not met. It provides for the public to be kept informed.
Environmental Quality Standards	It sets harmonised environmental quality standards for surface waters regarding 45 'priority substances' and eight other pollutants and includes a requirement to phase out discharges, emissions and losses of 21 'priority hazardous substances' within 20 years. Priority hazardous substances are

[125] Disclaimer: this listing doesn't pretend to be exhaustive

[126] Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy

127 Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy

128 Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy

[129] Directive 2004/35/CE of the European Parliament and of the Council of 21 April 2004 on environmental liability with regard to the prevention and remedying of environmental damage

[130] Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the protection of groundwater against pollution and deterioration

[131] Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe

Directive[132] (linked to WFD)	defined as 'substances or groups of substances that are toxic, persistent and liable to bio-accumulate, and other substances or groups of substances which give rise to an equivalent level of concern'. The 45 priority substances include industrial chemicals, plant protection products, biocides, metals (such as mercury and cadmium) and other groups like polyaromatic hydrocarbons (mainly incineration by-products) and polybrominated biphenylethers (used as flame retardants).
Industrial Emissions Directive (IED)[133]	It aims to achieve a high level of protection of human health and the environment taken as a whole by reducing harmful industrial emissions across the EU, in particular through better application of Best Available Techniques (BAT). Around 50,000 installations undertaking the industrial activities listed in Annex I of the IED are required to operate in accordance with a permit (granted by the authorities in the Member States). This permit should contain conditions set in accordance with the principles and provisions of the IED.
EPRTR Regulation[134]	The European Pollutant Release and Transfer Register (E-PRTR) provides access to information from some 24,000 industrial facilities concerning the annual amounts of pollutants released to air, water and land, as well as off-site transfers of waste and of pollutants in waste water.
Reduction in the sulphur content of certain liquid fuels[135]	The purpose of this Directive is to reduce the emissions of sulphur dioxide resulting from the combustion of certain types of liquid fuels and thereby to reduce the harmful effects of such emissions on man and the environment.
Reduction of national emissions of certain atmospheric pollutants[136]	The purpose is to make Member States limit their annual anthropogenic emissions of sulphur dioxide, nitrogen oxides, non-methane volatile organic compounds, ammonia and fine particulate matter in accordance with the national emission reduction commitments applicable from 2020 to 2029 and from 2030 onwards, as laid down in Annex II. Member States will have to prepare an annually update national emission inventories for the pollutants set out in Table A of Annex I, in accordance with the requirements set out therein.
The Water Framework Directive (WFD)[137]	It establishes a framework for the protection of inland surface waters, transitional waters, coastal waters and groundwater, with the objective to achieve and maintain Good Ecological Status and Good Chemical Status for the coastal and transitional waters
REACH (Registration, Evaluation, Authorisation and	It aims to improve the protection of human health and the environment through the better and earlier identification of the intrinsic properties of chemical

[132] Directive 2008/105/EC of the European Parliament and of the Council of 16 December 2008 on environmental quality standards in the field of water policy, amending and subsequently repealing Council Directives 82/176/EEC, 83/513/EEC, 84/156/EEC, 84/491/EEC, 86/280/EEC and amending Directive 2000/60/EC of the European Parliament and of the Council

[133] Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control)

[134] Regulation (EC) No 166/2006 of the European Parliament and of the Council of 18 January 2006 concerning the establishment of a European Pollutant Release and Transfer Register and amending Council Directives 91/689/EEC and 96/61/EC

[135] Directive (EU) 2016/802 of the European Parliament and of the Council of 11 May 2016 relating to a reduction in the sulphur content of certain liquid fuels

[136] Directive (EU) 2016/2284 of the European Parliament and of the Council of 14 December 2016 on the reduction of national emissions of certain atmospheric pollutants, amending Directive 2003/35/EC and repealing Directive 2001/81/EC

[137] Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy

Restriction of Chemicals)[138]	substances. REACH also aims to enhance innovation and competitiveness of the EU chemicals industry.
8th Environmental Action Programme (8th EAP)[139]	The proposal supports the environment and climate action objectives of the **European Green Deal**. It provides an opportunity for the EU as a whole to reiterate our commitment to the 7th EAP's **2050 vision**: it want to ensure wellbeing for all, while staying within the planetary boundaries. The 8th Environment Action Programme will guide European environmental policy until 2030
The Classification, Labelling and Packaging (CLP) Regulation[140]	It is based on the United Nations' Globally Harmonised System (GHS) and its purpose is to ensure a high level of protection of health and the environment, as well as the free movement of substances, mixtures and articles.
Sustainable Use of Pesticides Directive[141]	It aims to achieve a sustainable use of pesticides in the EU by reducing the risks and impacts of pesticide use on human health and the environment and promoting the use of Integrated Pest Management (IPM) and of alternative approaches or techniques, such as non-chemical alternatives to pesticides.
GMO Legislation[142]	The aims of this legislation are: - Protect human and animal health and the environment by introducing a safety assessment of the highest possible standards at EU level before any GMO is placed on the market. - Put in place harmonised procedures for risk assessment and authorisation of GMOs that are efficient, time-limited and transparent. - Ensure clear labelling of GMOs placed on the market in order to enable consumers as well as professionals (e.g. farmers, and food feed chain operators) to make an informed choice. - Ensure the traceability of GMOs placed on the market
Environmental Noise Directive[143]	The Directive applies to noise to which humans are exposed, particularly in built-up areas, in public parks or other quiet areas in an agglomeration, in quiet areas in open country, near schools, hospitals and other noise-sensitive buildings and areas. It does not apply to noise that is caused by the exposed person himself, noise from domestic activities, noise created by neighbours, noise at work places or noise inside means of transport or due to military activities in military areas.

[138] Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC

[139] https://ec.europa.eu/environment/pdf/8EAP/2020/10/8EAP-draft.pdf

[140] https://echa.europa.eu/regulations/clp/legislation

[141] Directive 2009/128/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for Community action to achieve the sustainable use of pesticides

[142] https://ec.europa.eu/food/plant/gmo/legislation_en

[143] Directive 2002/49/EC of the European Parliament and of the Council of 25 June 2002 relating to the assessment and management of environmental noise - Declaration by the Commission in the Conciliation Committee on the Directive relating to the assessment and management of environmental noise

Strategic Approach to Pharmaceuticals in the Environment[144]	The approach includes several actions aimed at minimising the emission of pharmaceuticals to the environment and their impacts on the environment and on human health via the environment.
Fertilisers Regulation[145]	It opens the single market for fertilising products which are not currently covered by harmonisation rules, such as organic* and organo-mineral* fertilisers, soil improvers*, inhibitors*, plant biostimulants*, growing media* or blends*. It lays down common rules on safety, quality and labelling requirements for fertilising products. It introduces limits for toxic contaminants for the first time. This will guarantee a high level of soil protection and reduce health and environmental risks while allowing producers to adapt their manufacturing process to comply with the new limits. It maintains optional harmonisation, as it does not prevent non-harmonised fertilising products from being made available on the internal market in accordance with national law and the general free-movement rules.
Detergents Regulation[146]	The regulation establishes common rules to enable detergents and surfactants to be sold and used across the EU, while providing a high degree of protection to the environment and human health.

Frameworks at international level as well as EU legislation cover broadly aspects related to pollution, primarily in the area of air and water pollution and quality. Several are the stated level of ambition over the next years, however, such frameworks are generally designed to be applied at country/Member State level, making their use in the framework of the taxonomy rather difficult.

For instance, the UN Sustainable Development Goals state that:

- (3.9.) By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination;
- (6.3) By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally;
- (12.4) By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimise their adverse impacts on human health and the environment

In the EU, the recently adopted EU Green Deal, among the different actions envisaged, includes one about 'Towards a zero-pollution ambition for a toxic free environment' under which the sustainability of chemicals, pollution of water, air and soil and the measures to address pollution from large industrial installations will be addressed over 2020 and 2021. However, clear targets and measures are not yet set.

Another example in the EU is the National Emission Ceiling Directive (NEC) Directive (EU 2016/2284; EU, 2016) that ensures emission ceilings that were in place for 2010 (established under the 2001

[144] https://ec.europa.eu/environment/water/water-dangersub/pdf/strategic_approach_pharmaceuticals_env.PDF

[145] Regulation (EU) 2019/1009 of the European Parliament and of the Council of 5 June 2019 laying down rules on the making available on the market of EU fertilising products and amending Regulations (EC) No 1069/2009 and (EC) No 1107/2009 and repealing Regulation (EC) No 2003/2003

[146] Regulation (EC) No 648/2004 of the European Parliament and of the Council of 31 March 2004 on detergents

NEC Directive) remain applicable until the end of 2019. After this date, new emission reduction commitments apply for 2020 to 2029, and later for 2030 onwards. Under the new Directive, Member States report annual emission inventory information from 1990 — or from 2000 in the case of PM2.5. Also in this case, drawing a link from Member State level to 'economic activity level', as envisaged for the taxonomy, results impractical.

The IED (Industrial Emissions Directive) may provide good references for the activities contributing under SC type 1.

Annex A.4: Listing of EU policies and targets – Biodiversity & Ecosystems[147]

Name of the policy	Policy objective / target
Biodiversity Strategy for 2030[148]	It aims to put Europe's biodiversity on a path to recovery by 2030 with benefits for people, the climate and the planet. It is also the proposal for the EU contribution to the upcoming international negotiations on the global post-2020 biodiversity framework. The Biodiversity Strategy aims is to build our societies' resilience to future threats such as climate change impacts, forest fires, food insecurity or disease outbreaks, including by protecting wildlife and fighting illegal wildlife trade. For example: By 2030, MS restoration targets (to be set by 2021): significant areas of degraded and carbon-rich ecosystems are restored; habitats and species show no deterioration; and at least 30% reach favourable conservation status…).
Farm-to-Fork Strategy 2020	The EU 2020 Farm to Fork Strategy aims to ensure sustainable food production, ensure food security, stimulate sustainable food processing, wholesale, retail, hospitality and food services practices, promote sustainable food consumption and facilitating the shift to healthy, sustainable diets, reduce food loss and waste, combat food fraud along the food supply chain, enable and promote the transition. For example: Ensure sustainable food production and reduce food loss and waste
Convention on Biological Diversity	The Convention has three main goals including: the conservation of biological diversity (or biodiversity); the sustainable use of its components; and the fair and equitable sharing of benefits arising from genetic resources.
Marine Strategy Framework Directive[149]	The ambition is to achieve Good Environmental Status (GES) of EU marine waters, GES is defined as 'The environmental status of marine waters where these provide ecologically diverse and dynamic oceans and seas which are clean, healthy and productive'. To better understand it, one can refer to the 11 descriptors defined in the Annex I of each Directive. For example: Non-indigenous species introduced by human activities are at levels that do not adversely alter the ecosystems
2020 Aichi targets	A set of 20 measures split in 5 strategic goals aiming at raising awareness, reducing pressure on the environment and implementing sustainable management practices
2013 Green Infrastructure Strategy	Qualitative ambitions to develop, preserve and enhance healthy green infrastructure to help stop the loss of biodiversity and enable ecosystems to deliver their many services to people and nature.
2013 EU Forest Strategy	Ensure that all forests in the EU are sustainably managed and that the EU's contribution to promoting sustainable forest management and reducing deforestation at global level is strengthened

[147] Disclaimer: this listing doesn't pretend to be exhaustive
[148] EU Biodiversity Strategy for 2030 Bringing nature back into our lives. COM 2020/380 final.
[149] Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy

EU Birds Directive 2009[150]	The directive aims to protect all European wild birds and the habitats of listed species, in particular through the designation of Special Protection Areas. For example: All 500 wild bird species naturally occurring in the EU to be protected
Habitat Directive 1992[151]	The Habitats Directive ensures the conservation of a wide range of rare, threatened or endemic animal and plant species. Some 200 rare and characteristic habitat types are also targeted for conservation in their own right. The Habitats Directive requires national governments to specify areas that are expected to be ensuring the conservation of flora and fauna species.
8th Environmental Action Programme (8th EAP)[152]	The proposal supports the environment and climate action objectives of the **European Green Deal**. It provides an opportunity for the EU as a whole to reiterate our commitment to the 7th EAP's **2050 vision**: it want to ensure wellbeing for all, while staying within the planetary boundaries. The 8th Environment Action Programme will guide European environmental policy until 2030

Other relevant public points of references:

- The Sectoral Reference Documents (SRD) on Best Environmental Management Practices (BEMP) for the agriculture sector
- The EU organic agriculture scheme
- The 1973 Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

Private initiatives:

- The CBD Technical Series No. 63 'Review of the biodiversity requirements of standards and certification schemes - A snapshot of current practice' released in 2011 lists down 36 standards covering eight sectors of activity: Agriculture (12 standards); Finance (5 standards); Fisheries and Aquaculture (5 standards); Forestry (4 standards); Carbon Offset (3 standards); Tourism (3 standards); Biotrade (2 standards); and Mining (2 standards).

[150] Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds
[151] Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora
[152] https://ec.europa.eu/environment/pdf/8EAP/2020/10/8EAP-draft.pdf

Annex B: How could we use Ecosystem Service accounting to set the level of ambition to reach substantial contribution for the EU taxonomy?

Ecosystem services can be defined as the contribution of ecosystems to human activities. They are flows (such as the generation of biomass, pollination, the removal of pollutants from air, soil and water, the natural protection from avalanches and floods, the opportunity for outdoor recreation) that connect ecosystems to the economy and society. They directly depend on the ecological status and condition of ecosystems: the more degraded the ecosystem, the lower the amount of services provided.

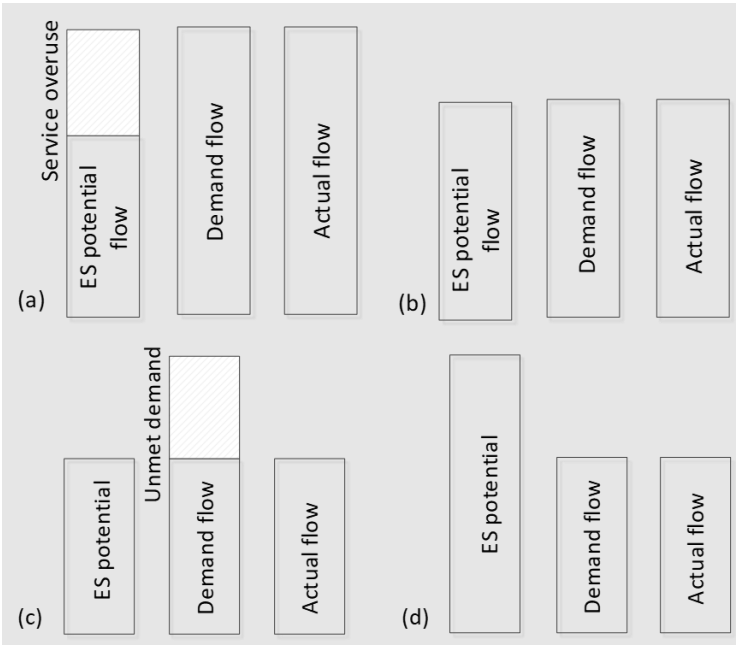
Based on the approach developed through the KIP INCA project153, to assess and value the use (i.e. actual flow) of ecosystem services (ES) we need to:

- map and assess ES potential, i.e. what ecosystems are able to provide (independently of their use);
- map and assess ES demand, i.e. who is going to use the ES (i.e. economic sectors and/or households).

When we face the case ES potential ≥ ES demand (ref. Figure 1 (b) and (d)), the ability of ecosystem to provide the same amount of ES flow is kept unchanged. However, the case ES potential < ES demand may occur for two reasons:

- for those ES where there is a regeneration rates for biomass extraction, and an absorption rates for pollutant removals, a higher demand generates an overuse of the ecosystem service (ref. Figure 1 (a)), that eventually lead to degradation. In this case the major driver of change lies in management practices;
- for all the other ES, a higher ES demand cannot be satisfied when ecosystems providing the services needed are not there. The need from the demand will remain unsatisfied (ref. Figure 1 (c)). In this case the major driver of change lies in land use/ conversion.

Figure 1- Match and mismatch between ES potential and ES demand

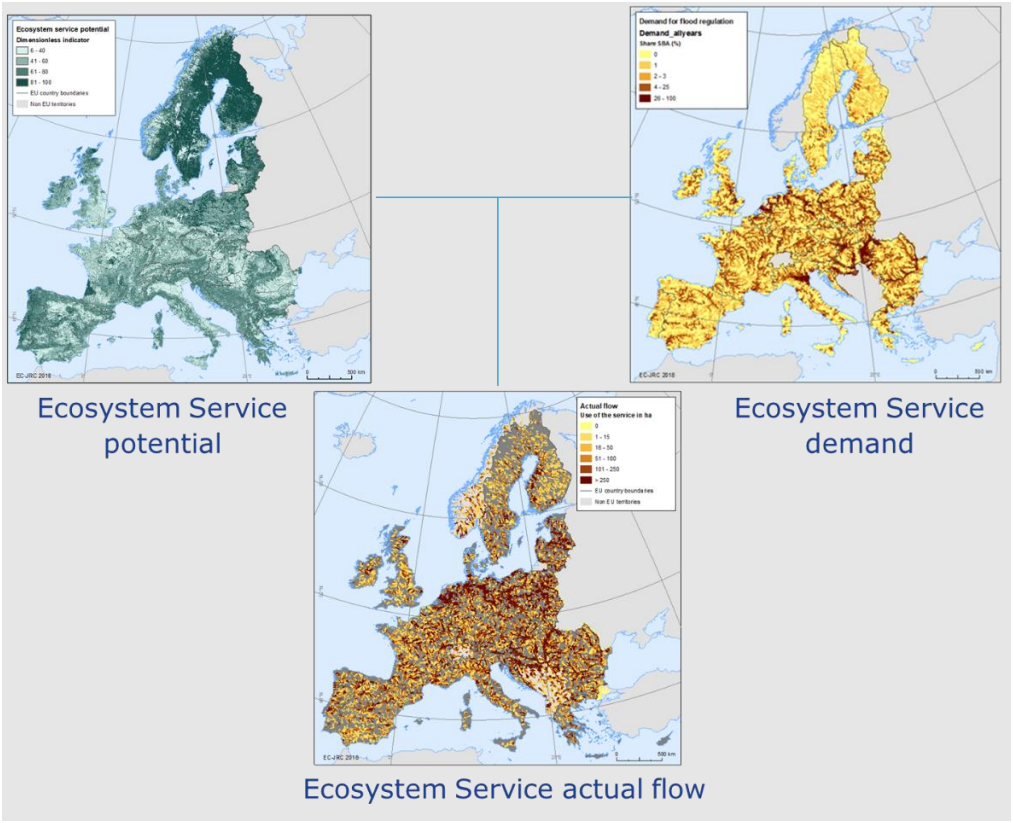


Source: La Notte *et al.* 2019

[153]https://ec.europa.eu/eurostat/documents/1798247/6079569/Leaflet+2019+%E2%80%93+The+INCA+project/

Let's consider a first example: the regulation of water flow by ecosystems that mitigate or prevent potential damage, i.e. 'flood control'. Figure 2 shows how from the interaction between ES potential (i.e. ecosystem ability to generate the service) and ES demand we assess the actual flow of the flood control ecosystem service.

Figure 2- Mapping and assessment of flood control potential, demand and actual flow, year 2012.



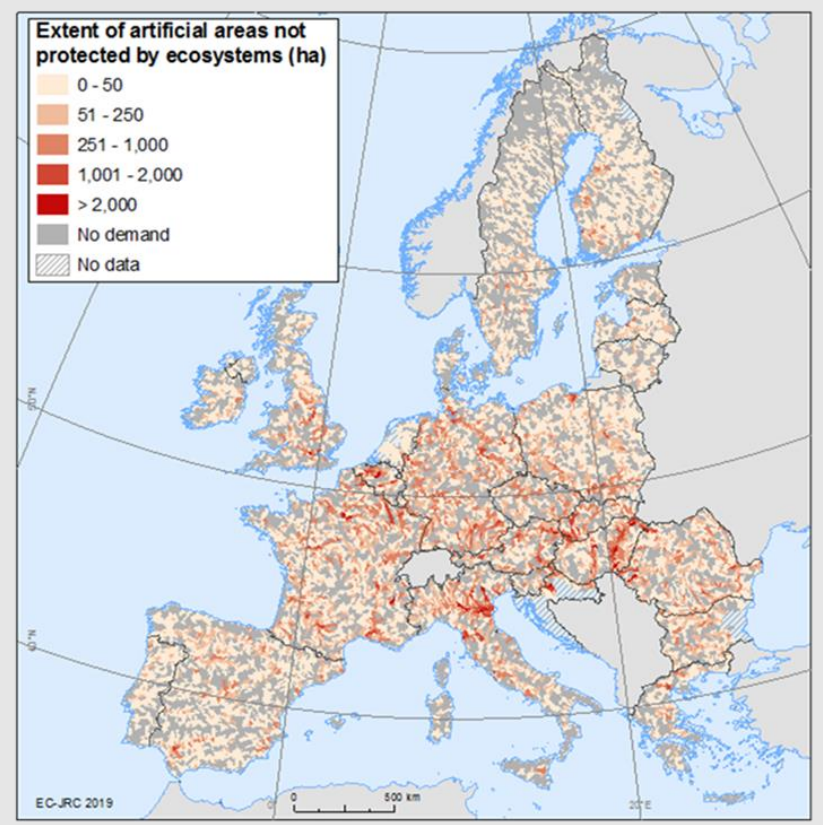
Source: adapted from Vallecillo *et al.* (2020)

What could matter in terms of identifying a substantial contribution is what we call the 'ES unmet demand' (Figure 3) because:

- acting on the ES potential side: it highlights where enhancements can be made, in terms of expanding natural area that can provide good level of flood protection (e.g. forest restorations and nature based solutions) to cover the ES unmet demand. This information can be useful for the corporate side to **prove the environmental sustainability of the investment**;
- acting on the ES demand side: it shows where not to place production (i.e. agricultural fields, industrial sites) and residential (i.e. tertiary and urban settlements) activities or critical infrastructures. This information can be useful from both the corporate and financial institutions side to **justify the reduction of risk**.

Any possible level for a substantial contribution can be based on the outcomes reported in Table 1. All information is spatially explicit and can be aggregated at different administrative levels. However, you need to keep in mind that at this stage mapping and assessment are undertaken at EU level (in terms of data, calibration and parameters).

Figure 3- Mapping and assessment of flood control unmet demand, year 2012.



Source: adapted from Vallecillo *et al.* (2020)

Table 1- Output extracted from the Flood control supply and use tables, years 2006 and 2012

FLOOD CONTROL AT THE EU LEVEL (EU26)

	2006	2012	Changes	Changes (%)
ES Potential (km²)	**2,400,630**	**2,400,417**	**-213**	**-0.01%**
ES Demand (km²)	**142,270**	**142,037**	**-233**	**-0.16%**
By artificial areas (km²)	18,560	18,859	299	1.61%
By agricultural areas (km²)	123,709	123,178	-532	-0.43%
ES Actual flow (km²)	**41,880**	**41,696**	**-184**	**-0.44%**
In artificial areas (km²)	4,967	4,982	15	0.30%
In agricultural areas (km²)	36,913	36,714	-199	-0.54%
Unmet demand (km²)	**95,169**	**95,111**	**-58**	**-0.06%**
Unmet demand artificial areas (km²)	12,544	12,782	238	1.90%
Unmet demand agricultural areas (km²)	82,625	82,329	-296	-0.36%

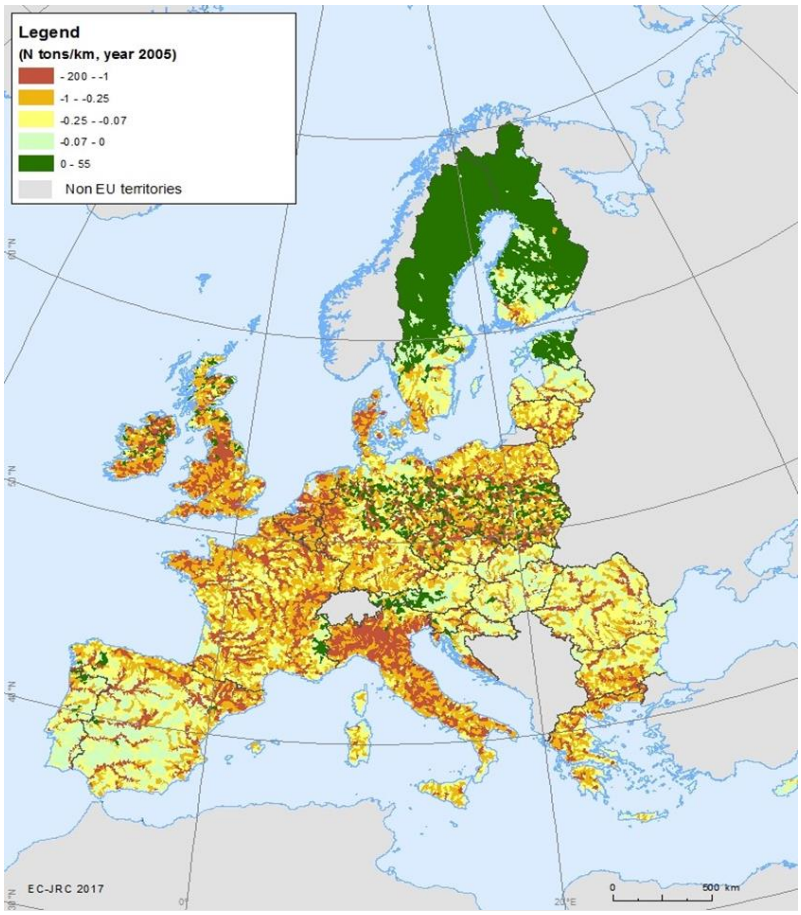
Source: Vallecillo et al. (2020)

A second example refers to the removal of pollutants by freshwater ecosystems, i.e. water purification service[154]. In this case study, the main driver of change is the emission of nitrogen (N) from the agricultural sector through the use of fertilizers.

Figure 4 maps the areas where the actual flow is higher than the sustainable flow, i.e. where there is an overuse of the water purification service because the emissions of N are more than can be removed by freshwater ecosystems. What could matter in terms of identifying a substantial contribution is what we call 'ES overuse' because:

- acting on the ES potential side: it is possible to set a sustainability threshold according to a substantial contribution level and measure how far a sustainable use of the service is from the actual use of the service. This information can support the corporate side to **justify the environmental sustainability of the investment** (e.g. to reduce emissions by adopting sustainable practices such as organic farming);
- acting on the ES pressure (demand side): it shows where critical areas (more vulnerable in terms of environmental degradation) are placed and are thus in need of long-term rehabilitation programs. This information can be useful from both the corporate and financial institutions side **to justify the reduction of risk**.

Figure 4 – Mapping and assessment of water purification overuse, year 2005.



Source: La Notte *et al.*, 2017

In our pilot application we refer to a sustainability threshold (of 1mg/l) which corresponds to a 'high' level of the Good Ecological Status (Grizzetti et al., 2017).

[154] Please consider that the data here reported refer to the pilot application. A new run of the accounts is in progress. The biophysical model was provided by our colleagues from D.2 Unit.

Any possible level for a substantial contribution can be based on the outcomes reported in Table 2. All information is spatially explicit and can be aggregated at different administrative levels. Once again, you need to keep in mind that mapping and assessment are undertaken at EU level (in terms of data, calibration and parameters).

Table 2- Output extracted from the Water purification supply and use tables, years 1985, 1995 and 2005

WATER PURIFICATION AT THE EU LEVEL (EU27)

	1985	1995	2005
River area covered by the study (km^2)		4,092,329	
River network (km^2)		368,886	
Total nitrogen input (ton km^2 $year^{-1}$)	13.06	11.47	10.00
Sustainable river nitrogen removal (10^3 kg km^{-1} $year^{-1}$)	0.40	0.47	0.56
Actual river nitrogen removal (10^3 kg km^{-1} $year^{-1}$)	4.01	3.65	3.10

Source: La Notte *et al.* (2017)

The INCA project was set up as an experimental EU-level exercise to develop ecosystem accounts using existing data collected for different purposes (e.g. reporting by Member States to the EEA, Eurostat, etc.). Being the first of its kind, data inventories, methods and procedures had to be set up 'from scratch'. As a result, the project could not deliver the timeliest results at this stage. However, as ecosystem accounting is on the rise at the global level, substantial activities to significantly speed up and further harmonise the production of ecosystem services accounts have been planned also in the EU from 2021 onwards. This has been foreseen to entail the development of tools for a more efficient production, with a view for a regular annual production of ecosystem services accounts for the EU. In addition, the adoption of an international statistical standard for ecosystem accounting at the UN level[155], foreseen for March 2021, will help harmonise concepts and methods and is expected to further boost activity in ecosystem accounting.

References

La Notte A., Vallecillo, S., Marques, A., Maes, J.. 2019. 'Beyond the economic boundaries to account for ecosystem services', *Ecosystem Services*, 35: 116-29.

Vallecillo, S., Kakoulaki, G., La Notte, A., Feyen, L., Dottori, F., Maes, J.(2020) 'Accounting for changes in flood control delivered by ecosystems at the EU level', Ecosystem Services, 40.

La Notte, A., Maes, J., Dalmazzone, S., Crossman, N., Grizzetti, B., Bidoglio, G., 2017. 'Physical and monetary ecosystem service accounts for Europe: A case study for in-stream nitrogen retention', *Ecosystem Services*, 23: 18-29.

Grizzetti, B., A. Pistocchi, C. Liquete, A. Udias, F. Bouraoui, van de Bund, W., 2017. 'Human pressures and ecological status of European rivers', *Scientific Reports*, 7: 205

[155] The System of Environmental Economic Accounts – Ecosystem Accounting handbook https://seea.un.org/content/seea-experimental-ecosystem-accounting-revision

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