

D4.1: Overview of Relevant Standards and Regulations

V1.2

Geparametriseerde LevensCyclus Inventarisatie analyse
van elektronica productie
HBC.2024.0582 COOCK+ LCI-e



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10/02/2026

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ISO 20400

ISO 22095

Material declaration standards

IEC 62474, IEC/ISO 82474, IPC 1752

Waste



Waste Framework Directive (LoW codes & R/D codes)



PPWR



WEEE directive

Various



RoHS directive



REACH regulation



POPs regulation

IPC sustainability standards

A few definitions

Standards

Standards in general

A formal technical document that has been established and approved by a recognized body and sets out agreed rules, procedures or specification for consistent and repeated application.

It provides a structured approach to safeguard quality, compatibility and efficiency.

Standards are based on validated scientific, technological, and practical knowledge and are typically the result of collaborations between stakeholders and technical experts.

The use of standards is voluntary. *Standards only become binding if they are the subject of contracts between parties or if compliance with them is mandatory by law.*

A few definitions

Standards

ISO standards

ISO = the International Organization for Standardization

*This organisation brings global experts together to agree on the best way of doing things – for anything from making a product to managing a process. ISO standards are therefore **internationally agreed upon**. These include quality management standards, **environmental management standards**, health and safety standards, energy management standards,...*

Source: [ISO - About ISO](#)

IEC standards

IEC = International Electrotechnical Commission

International standardization body for the electrical and electronic sectors. It comprises national electrotechnical committees from around the world. The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields IEC collaborates closely with the International Organization for Standardization (ISO)

Source: [IEC](#)

A few definitions

Standards

ITU standards

ITU = International Telecommunication Union

Is the United Nations' specialized agency for information and communication technologies (ICTs). Works closely with ETSI, ISO and IEC to ensure coherence in global ICT standardization. Develops global technical standards to ensure interoperability of ICT systems and networks. For example: environmental impact of ICT (e.g. ITU-T L series).

Source: [About ITU](#)

European (EN) standards

Within Europe, a European Standard (EN) is developed and adopted by the recognized European standardization organizations: CEN, CENELEC, and ETSI (European Telecommunications Standards Institute). Once approved, it must be implemented as a national standard by all CEN and CENELEC member bodies. As such, EN standards become part of the official standards catalogues across 34 national standardization bodies.

Source: [CEN-CENELEC](#)

A few definitions

Standards

Harmonised standards

A harmonised standard is a European standard developed by a recognised European Standards Organisation: CEN, CENELEC, or ETSI. It is created following a request from the European Commission to one of these organisations. Manufacturers, other economic operators, or conformity assessment bodies can use harmonised standards to demonstrate that products, services, or processes comply with relevant EU legislation.

The references of harmonised standards must be published in the Official Journal of the European Union (OJEU).

Source: [Harmonised standards](#)

A few definitions

Standards

Belgian standards

NBN = Bureau for Standardisation

This national standardization body of Belgium is responsible for the development, approval, and publication of Belgian standards along with the implementation of European (EN) and international (ISO) standards as national standards. The organisation represents Belgium in European and international standardization organizations, such as **CEN**, **CENELEC**, and **ISO**.

Source: [About NBN](#)

<i>Belgian Standard</i>	
ISO 14006:2020	┐ NBN
EN ISO 14006:2020	
NBN EN ISO 14006:2020	└ ┘

A few definitions

EU Legislative and Non-legislative Instruments

Regulation

Is a **legislative act that is binding** and directly applicable in all Member States without national transposition. Once adopted, it becomes immediately enforceable as law across the EU and ensures uniform rules in all countries.

Directive

Is a **legislative act that is binding** (in terms of result) and sets out objectives that EU countries must achieve. The Member States need to transpose this in national law. Hence this allows flexibility in the means through which the MS achieve these objectives.

It is important to distinguish between minimum and maximum (or full) harmonisation requirements in directives.

In the case of minimum harmonisation, a directive sets minimum standards, often in recognition of the fact that the legal systems in some Member States have already set higher standards. In this case, Member States have the right to set higher standards than those set in the directive. Example: Waste of Electrical and Electronic Equipment.

In the case of maximum harmonisation, Member States have to introduce rules with minimum and maximum standards set in the directive. Example: Restriction of Hazardous Substances.

A few definitions

EU Legislative and Non-legislative Instruments

Decision

Is a **legislative act that is binding** on those to whom it is addressed (e.g. an EU country or an individual company). It is directly applicable and enforceable upon those to whom it is addressed, without requiring national transposition.

Recommendation

Recommendations are non-binding. They allow the EU institutions to make their views known and to suggest a line of action without imposing any legal obligation on those to whom it is addressed.

A few definitions

EU Legislative and Non-legislative Instruments

Delegated act

*A delegated act is a **non-legislative act** adopted by the European Commission to supplement or amend certain non-essential elements of a legislative act since it can be necessary to update it to reflect developments in a particular sector or to ensure that it is implemented properly.*

Implementing act

*An implementing act is a **non-legislative act** adopted by the European Commission to ensure uniform implementation of legally binding Union law across Member States. It is used when uniform conditions for implementation are necessary.*

*While both are non-legislative these are **legally binding**.*

A few definitions

EU Legislative and Non-legislative Instruments

Amending acts

Amending means that an existing legislative act, such as a directive or regulation, is formally changed or update to a new legal act. This can involve:

- *Adding new provisions to the original act*
- *Changing existing text, such as updating definitions, timelines, or obligations*
- *Removing outdated or incorrect parts of the law*

*Amendments retain the original legal act which means that the original directive or regulation remains in force, but its content is modified as specified in the amendment. Amending acts are **legally binding** once adopted.*

*For example: Directive 2014/95/EU **amended** Directive 2013/34/EU by introducing new rules on non-financial reporting for certain large companies. Rather than creating an entirely new directive, it inserted new articles and paragraphs into the existing framework.*

Source: [Modifying EU Treaties](#)

A few definitions

EU Legislative and Non-legislative Instruments

Proposal

*A proposal is **pre-legislative and non-binding** which outlines a draft legislative act and marks the starting point of the EU legislative process. It becomes only binding after adoption through the legislative procedure. The proposal can be negotiated and amended.*

Source: [Law making process](#)

Opinion

*This is a **non-binding** statement or assessment issued by an EU institution or advisory body in response to a legislative proposal or policy.*

Source: [Types of legislation](#)

Communication

*Is a **non-binding** policy document issued by the European commission to set out policy intentions, outline future legislative plans or clarify existing policy frameworks.*

	International (generic) standards	EU instruments	Supporting methods, frameworks and sector specific standards
Impact assessments		2021/2279/EU	
	ISOs for LCA	EF method (EU recommendation)	
	14040 and 14044 14072 (organizational)	- PEF and OEF method - PEFCR and OEFSR	ILCD handbook
	ISOs for EPD	2024/1252/EU	ITU-T L.1400 Series
	14020 series	EF for CRM (CRM Act)	Avoided Emissions (WBCSD)
	GHG		NCIA for ICT solutions
	GHG protocol, avoided emissions		
Eco-design		2024/1781/EU	SSbD framework
	ISO for eco-design	ESPR (EU Regulation)	
	14006 and IEC 62430 (ECD)	- Performance requirements - Information requirements (DPP)	MEErP
		2015/863/EU	
	ISOs for CE	RoHS 3 (EU Directive)	
	ISO 59020 and others	1907/2006	
		REACH (EU Regulation)	
		2019/1021	
		POPs (EU regulation)	
		2012/19/EU	
		WEEE (EU Directive)	

International (generic) standards

EU instruments

Supporting methods, frameworks and sector specific standards

Corporate responsibility

GRI standard

SBTi

Management standards

14001 and others
14060 series on GHG and carbon footprint

CSRD

CSDDD

EU Taxonomy

Omnibus package

EU Green Claims

2022/2464/EU

2024/1760/EU

2020/852/EU

COM(2025)81

2023/0085/COD

GHG protocol

EF method

ISO's for impact assessments

Sourcing and traceability

IEC/ISO material declaration

IEC/ISO 82474-1

ISO sustainable procurement & traceability

ISO 20400 & ISO 22095

EU Conflict Minerals Regulation

Critical Raw Materials act

2017/821/EU

2024/1252/EU

IEC 62474 material declaration

For electrotechnical industry

IPC 1752 material declaration

Electronics

EU regulation/directive = legally binding

Non-legislative EU instruments = not legally binding

Frameworks, methods and specific standards

International standards

Impact assessments



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LCA and environmental footprint



ISO standards for LCA

ISO 14040:2006, ISO 14040:2006/Amd1:2020

Environmental management – Life cycle assessment – Principles and framework

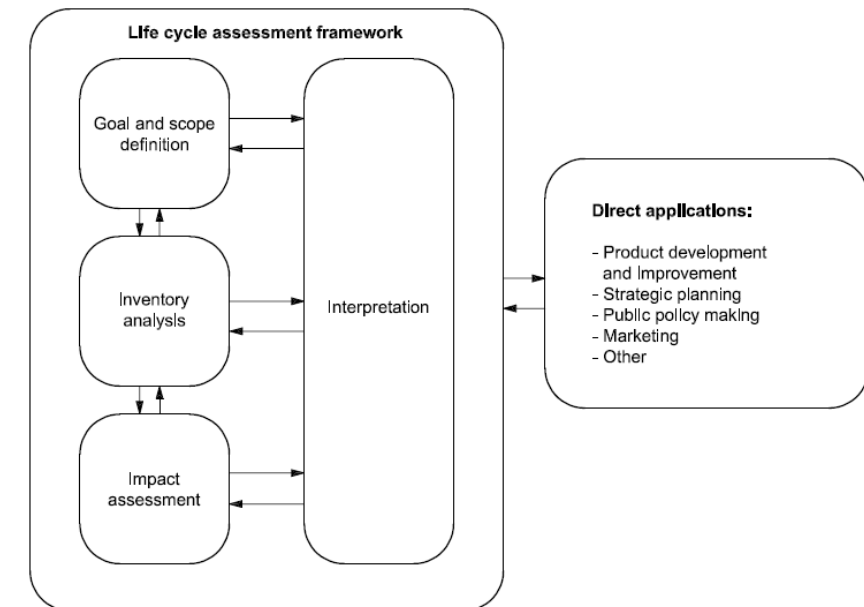
- Applies to all products and services.
- Key goal: Ensure transparency on assumptions and context of LCA/LCI studies by providing requirements and recommendations. No detailed specification of LCA techniques or methodologies.

Outlines structure of conducting LCA, core principles, Framework and phases of the method.

Assessment in four interrelated and iterative key phases:

- The Goal and Scope definition
- The Life Cycle Inventory (LCI) analysis
- The Life Cycle Impact Assessment (LCIA)
- The life cycle interpretation phase

Includes the reporting strategy, review and documentation.



ISO standards for LCA

ISO 14040:2006, ISO 14040:2006/Amd1:2020

Key concepts

Functional unit

- Definition: quantified performance of a product system for use as a reference unit.
- The LCA is structured around a functional unit. It defines what is studied and determines product boundaries and the inputs and outputs.

Product System

- Definition: collection of unit processes with elementary and product flows, performing one or more defined functions, and which models the life cycle of a product.

Reference flow

- Definition: measure of the outputs from processes in a given product system required to fulfil the function expressed by the functional unit.

LCA is relative (to functional unit), iterative, transparent, comprehensive.

ISO standards for LCA

ISO 14044:2006

Environmental management – Life cycle assessment – Requirements and guidelines

Complements and expands ISO 14040:

- The methodological guidance
- The requirements for performing an LCA
- Provides more specific rules and elaborates on the methodology
- How inputs and outputs are assigned to parts of a product system
- How to conduct data quality analysis, sensitivity and uncertainty analysis

Improves credibility, reproducibility, comparability and data interpretation.

No requirements for particular impact categories, but guides what can be appropriate, based on the system in scope.

ISO standard for organizational LCA

ISO 14072:2024

Environmental management — Life cycle assessment — Requirements and guidance for organizational life cycle assessment

Applies to LCA for organizations. It, therefore, extends the application of ISO 14040 and ISO 14044 **to all the activities of the organization**, meaning that the reporting unit of the system allows **coverage of different products and unit processes of any organization** within the same LCA study. Specifies additional requirements and gives guidance for an effective application of ISO 14040:2006 and ISO 14044:2006 to organizations. It provides:

- The application of life cycle assessment (LCA) principles and methodology to organizations
- The benefits that LCA can bring to organizations by using LCA methodology at an organizational level
- The system boundary
- Specific considerations when dealing with life cycle inventory (LCI), life cycle impact assessment (LCIA) and interpretation
- The limitations regarding reporting, environmental declarations and comparative assertions

Of interest to any organization that has interest in applying LCA. **Specifically covers the goals of ISO 14040 and ISO 14044.**

ISO standards for Environmental Product Declarations (EPD)

ISO 14020 series framework - ISO 14020:2022

Environmental statements and programmes for products — Principles and general requirements

Establishes principles and specifies general requirements that are applicable to all types of product-related environmental statements and environmental statement programmes. Environmental statements result from environmental statement programmes and include self-declared environmental claims, ecolabels, environmental product declarations (EPDs) and footprint communications. It is intended to be used in conjunction with other standards in the ISO 14020 family which contain additional terms and definitions, principles and requirements that are relevant to their specific scopes.

ISO standards for Environmental Product Declarations (EPD)

Environmental labels and declarations

ISO 14021:2016

*Environmental labels and declarations - Self-declared environmental **claims** (Type II environmental labelling)*

specifies requirements for self-declared environmental claims, including statements, symbols and graphics, regarding products.

ISO 14024:2018

*Environmental labels and declarations - Type I environmental **labelling** - Principles and procedures*

for developing Type I environmental labelling programmes, including the selection of product categories, product environmental criteria and product function characteristics, and for assessing and demonstrating compliance. It also establishes the certification procedures for awarding the label. Third party certified labels.

ISO standards for Environmental Product Declarations (EPD)

Environmental labels and declarations

ISO 14025:2006

Environmental labels and declarations – Type III environmental declarations – Principles and procedures

for developing Type III environmental declaration programmes and Type III environmental declarations (EPDs) based on ISO 14040/14044. Type III declarations are primarily intended for use in B2B communication, but their use in B2C communication is not precluded.

- E(P)Ds are based on environmental data and designed to be transparent and comparable within a product category.
- A programme managed by a programme operator develops Product Category Rules based on LCA(s).
- To be replaced by ISO/DIS 14025 env. statements and programs for products.

ISO 14026:2017

*Environmental labels and declarations - Principles, requirements and guidelines for **communication of footprint information**.*

Addresses areas of concern relating to the environment and provides requirements and guidelines for footprint communication programmes, as well as requirements for verification procedures.

ISO standards for Environmental Product Declarations (EPD)

Environmental labels and declarations

ISO/TS 14027:2017

Environmental labels and declarations – Development of product category rules

Provides principles, requirements and guidelines for developing, reviewing, registering and updating PCR within a Type III environmental declaration or footprint communication programme based on life cycle assessment (LCA) according to ISO 14040 and ISO 14044 as well as ISO 14025, ISO 14046 and ISO/TS 14067.

It also provides guidance on how to address and integrate additional environmental information, whether or not it is based on LCA in a coherent and scientifically sound manner according to ISO 14025.

Support and EPD database

- EPD International AB – Stockholm, Sweden
- Global programme - International EPD System: www.environdec.com
- EPD portal: <https://portal.environdec.com/>

UN standards for impact assessment in ICT

International Telecommunication Union-T L 1400 series

ITU is a specialized agency of the UN responsible for information and communication technologies.

ITU-T L.1400 (03/23)

Overview and general principles of methodologies for assessing the environmental impact of information and communication technologies

Developed by ITU to evaluate environmental performance of **ICT goods, services and infrastructure**. Supports **life cycle-based sustainability assessment** across the ICT sector. L series: Environment and ICTs, climate change, e-waste, energy efficiency; construction, installation and protection of cables and other elements of outside plant. L.1400-L.1499: Assessment methodologies of ICTs and CO₂ trajectories.

UN standards for impact assessment in ICT

International Telecommunication Union-T L 1400 series - ITU-T L.1410 (11/2024)

Methodology for environmental life cycle assessments of information and communication technology goods, networks and services

deals with environmental life cycle assessments (LCAs) of information and communication technology (ICT) goods, networks and services.

Part I: ICT life cycle assessment: framework and guidance. Life cycle assessment (LCA) methodology applied to ICT goods, networks and services.

Part II: Comparative analysis between ICT and reference product system (baseline scenario); framework and guidance. Comparative analysis based on LCA results of an ICT goods, networks and services product system, and a reference product system.

- Assesses **first-order impacts** (e.g. manufacturing, operation, disposal)
- Based on **ISO 14040/14044**, with **ICT-specific refinements**
- Focuses on **direct environmental effects** of ICT systems
- Developed with **ETSI TC EE**, ensuring **international and EU framework consistency**. ETSI is a European Standards Organization (ESO) creating harmonized (EN) standards supporting EU legislation. (Other ESO's: CEN and CENELEC). **ITU-T L.1410 = ETSI ES 203 199**

UN standards for impact assessment in ICT

International Telecommunication Union-T L 1400 series - ITU-T L.1410 (11/2024)

Definition ICT

- **ICT goods:** tangible goods deriving from or making use of technologies devoted to or concerned with:
 - the acquisition, storage, manipulation (including transformation), management, movement, control, display, switching, interchange, transmission or reception of a diversity of data;
 - the development and use of the hardware, software and procedures associated with this delivery; and
 - the representation, transfer, interpretation and processing of data among persons, places and machines, noting that the meaning assigned to the data is preserved during these operations.
- **ICT network:** set of nodes and links that provide physical or over the air information and communication connections between two or more defined points
- **ICT service (application):** use of ICT goods and/or Networks to provide value to one or more users

UN standards for impact assessment in ICT

International Telecommunication Union-T L 1400 series

ITU-T L.1480 (07/2025)

Enabling the Net Zero transition – Assessing how the use of information and communication technology solutions impacts greenhouse gas emissions of other sectors

- Assesses **second-order (enabling)** and **higher-order (systemic/rebound)** effects
- Evaluates **net GHG impact** between ICT vs. non-ICT scenarios
- Tools: **Consequence trees**, context analysis (user behavior, policies, innovation)
- Differentiates between **absolute** vs. **relative** reductions and short- vs. long-term impacts
- Can extend to **pollution, resource use, biodiversity**



Product Environmental Footprint (PEF) method

Recommendation 2013/179/EU - replaced

on the use of common methods to measure and communicate the life cycle environmental performance of products and organisations

Updated in 2021 by Recommendation 2021/2279

Developed by the **European Commission** to **standardize** environmental **impact assessment** of **products** (goods or services).

Based on ISO 14040 – aligned with its 4 LCA phases:

1. Goal and Scope Definition
2. Life Cycle Inventory (LCI)
3. Life Cycle Impact Assessment (LCIA)
4. Interpretation



Enhances ISO approach with detailed guidance to **reduce variability** and improve consistency. Evaluates **16 environmental impact categories**. Includes mandatory **normalisation and weighting** for aggregated impact comparison. Has moved from a pilot to transitional phase and will be reviewed in 2025 with the aim to develop a new recommendation (not yet mandatory).



Environmental Footprint Method

Recommendation 2021/2279/EU

on the use of the Environmental Footprints methods to measure and communicate life cycle environmental performance of products and organisations. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32021H2279>

- Replaces 2013/179/EU to promote EF methods for assessing life cycle environmental performance
- **Promote the use of Environmental Footprint methods** related to measurement and communication of the life cycle environmental performance of **all kind of products**, including both goods and services, **and of organisations**.
- The EF methods are not mandatory (recommendation) but are strongly promoted. They are used in the context of several EU policies and legislations:
 - Green public procurement (GPP) criteria
 - Product Environmental Footprint Category Rules (PEFCRs)
 - EU ecolabel criteria

Under the **Ecodesign for Sustainable Products Regulation (ESPR)**, the EF method is expected to be one of the **reference methods** for assessing environmental performance.

The **CSRD and the European Sustainability Reporting Standards (ESRS)** do not explicitly require PEF/OEF, but the **life cycle approach** in climate and environmental impact reporting is **aligned with the EF methodology which is also referenced by these instruments**.



Environmental Footprint Method

Recommendation 2021/2279/EU

Methods and terminology

- **PEF**: Product Environmental Footprint
 - Result of general method to measure and communicate environmental impact of a product
 - PEF Method specification: Annex I
- **PEFCR**: Product Environmental Footprint Category Rules
 - Product category specific rules complementary to PEF method mandatory to be used for PEF if exists.
 - Requirements to develop PEFCRs and perform PEF per PEFCR: Annex II
- **OEF**: Organisation Environmental Footprint
 - Result of general method to measure and communicate environmental impact of an organisation
 - OEF Method specification: Annex III
- **OEFSR**: Organisation Environmental Footprint Sector Rules
 - Sector specific rules complementary to OEF method mandatory to be used for PEF if exists.
 - Requirements to develop OEFSRs and perform OEF per OEFSR: Annex IV
- **Scheme**: initiative that requires the measurement or communication of life cycle performance.



Environmental Footprint Method

Recommendation 2021/2279/EU

PEF/OEF methods and rules:

- To be used for the measurement or communication of the life cycle environmental performance of the products or the organization of companies. (4.1)
- As reference in the schemes requiring the measurement or communication of the life cycle environmental performance. (5.1)

Promotion of methodology by industry associations (4.4, 4.7) and financial community (6).

Support PEF/OEF use:

- Contribute to public databases (companies 4.2, industry associations 4.5)
- Companies provide support to their supply chain especially SME (4.3)
- Industry associations provide tools and expertise to SME member companies (4.6)

For Companies and Organisations:

- **Assess and communicate environmental performance**
- Use and support EF-compliant **datasets**
- **Collaborate across supply chains** using PEF/OEF and PEFCRs/OEF SR



Environmental Footprint Method

Recommendation 2021/2279/EU

Each requirement is based on recognized product environmental accounting methods and guidance documents.

- ISO: 14040 (LCA principles), 14044 (LCA – requirements), CEN ISO/TS 14071 (LCA – additional requirements ISO14044), 14067 (C-footprint), 14046 (water footprint), 14020/21/25 (Eco-labels), 14050 (Environmental management), CEN ISO/TS 14071 (LCA – additional requirements)
- ILCD Handbook (International Reference Life Cycle Data System)
- Greenhouse Gas Protocol – Product Life Cycle Accounting and reporting Standard
- BP X30-323-0 General principles for an environmental communication on mass market products. (French standard)



Environmental Footprint Method

Recommendation 2021/2279/EU – Annex 1 PEF Method

1. Product Environmental Footprint Category Rules: to make PEF studies easier, faster and less costly by focusing on what matters most for a product category.
2. General considerations for PEF studies
3. Defining the goals and scope of the PEF study
4. **Life Cycle Inventory**: screening, life cycle stages, nomenclature, modeling requirements, multi-functional processes, data collection and quality requirements
5. Environmental Footprint impact assessment: classification, characterization, normalization, weighting.
6. Interpretation of PEF results
7. PEF reports
8. Verification and validation of PEF studies, reports, and communication vehicles



Product Environmental Footprint Category Rules (PEFCRs)

Recommendation 2021/2279/EU

PEF = harmonised LCA-based approach, PEFCRs provide specificities at product group level (e.g. life cycle stages, datasets, impact categories, modelling assumptions).

The aim:

- **Enable fair comparison** within the same category.
- Support **product claims, eco-labelling**, and potentially **green public procurement (GPP)**.
- Align and harmonise with existing frameworks such as:
 - ISO 14025 (**Product Category Rules for Environmental Product Declarations**)
 - The **GHG Protocol Product Standard**
 - **PAS 2050** (UK)
 - National systems like **BP-X30 (France)** or **TS 0100 (Japan)**
 - Global platforms like **UNEP's GLAD initiative**
 - ISO/TS 14067:2013 (**carbon footprint** guidelines)

Developed via EU-led multi-stakeholder pilots, endorsed by the Commission. While voluntary they are referenced in EU initiatives like Green claims directive, eco-design for sustainable products regulation (ESPR),...

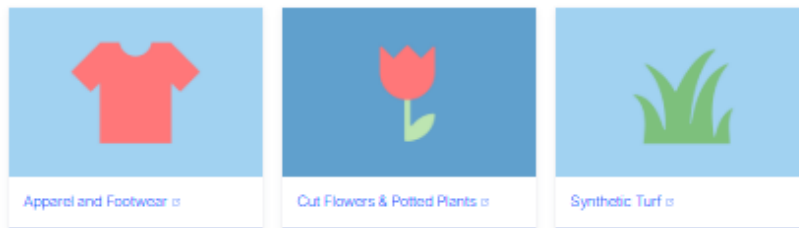


Product Environmental Footprint Category Rules (PEFCRs)

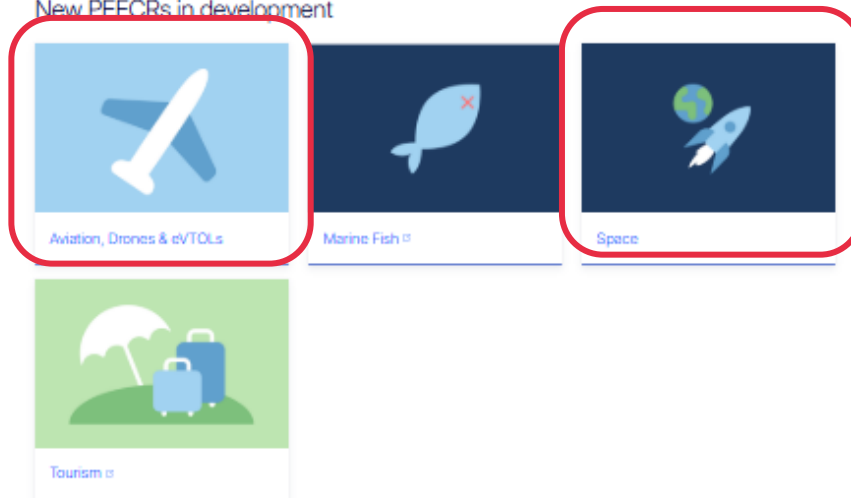
Recommendation 2021/2279/EU

Electronics-related PEFCR:

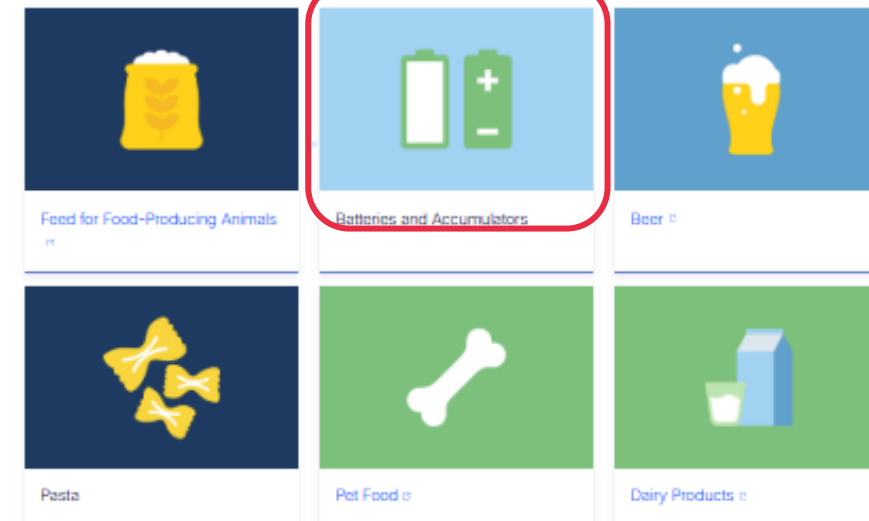
New PEFCRs



New PEFCRs in development



PEFCRs in revision





Product Environmental Footprint Category Rules (PEFCRs)

Recommendation 2021/2279/EU – Annex 2: PEFCR development

Product Environmental Footprint Category Rules: product category specific rules supporting complementing PEF method and supporting PEF study.

- Additional specificity to international standard ISO 14025.
- Specifies link with ISO 14025 Type III environmental declarations: a possible PEF study application. (A.1.1)
- Specifies how to manage modularity (A.1.2.)

Development of PEFCR:

- By a Technical Secretariat representing $\geq 51\%$ EU market in turnover proved to the commission.
- Based on a PEF study of a representative (real or virtual) product (RP)



Organisation Environmental Footprint (OEF) method

Recommendation 2021/2279/EU

Multi-criteria method by the **European Commission** to assess the environmental performance of an organisation.

Scope Includes:

- **Upstream, Direct operations, Downstream**

OEF Methodology Phases (Verification at all stages):

1. **Goal and Scope Definition**
2. **Life Cycle Inventory (LCI)** – data on inputs/outputs/emissions
3. **Life Cycle Impact Assessment (LCIA)** – quantifies impacts
4. **Interpretation and Reporting** – evaluates hotspots, guides improvement

Organisation Environmental Footprint Sector Rules (OEF SRs):

- Sector-specific guidelines to ensure **relevance, accuracy, and comparability**.
- Define key processes, impact categories, and data quality rules.





European Platform on LCA - ILCD

EPLCA

- The EPLCA is the EU's knowledge base that responds to business and policy needs towards sustainable production and consumption.
- The EPLCA supports the methodological development of Life Cycle Assessment (LCA) for the analysis of supply chains and end-of-life waste management.
- The EPLCA fosters LCA as an essential integrated environmental assessment in support to the EU policy making process and the ambition of Green Deal, and many other policy initiatives, with specific reference to the Circular Economy Action Plan, the Farm2Fork, the Biodiversity Strategy, the Chemical strategy, and many more.



European Platform on LCA - ILCD

International Reference Life Cycle Data System (ILCD) Handbook

The International Reference Life Cycle Data System (ILCD) is an initiative developed by JRC and DG ENV since 2005, with the aim to provide guidance and standards for greater consistency and quality assurance in applying LCA. ILCD publications have been established through a series of extensive public and stakeholder consultations.

ILCD laid the **foundational structure** and data format for both the **PEF** and **OEF** methods.

Builds on ISO 14040/14044 by offering more practical rules on data quality, documentation, and methodology.

Serves as a **bridge between ISO standards and the EU Environmental Footprint (EF) method**.



European Platform on LCA - ILCD

International Reference Life Cycle Data System (ILCD) Handbook

International Reference Life Cycle Data System (ILCD) Handbook

General guide for Life Cycle Assessment – Detailed guidance.

- Serves as a parent document that aids the development of application-specific, sector-specific and product-group specific guidance documents, criteria and related eco-design type tools.
- It provides detailed guidance for planning, developing, and reporting both life cycle emission and resource consumption inventory (LCI) data sets and Life Cycle Assessment studies.
- It is complemented by specific guides on the development of Life Cycle Inventory (LCI) data sets, the development of Life Cycle Impact Assessment models & indicators, as well as on performing reviews of LCI data sets, LCA studies, and of specific guides and simplified approaches.
- This guide is further supported with an LCA study report template, an LCI data set documentation format, a document on nomenclature and other conventions, and a terminology.

The **EF method** further refines ILCD guidance with stricter, harmonised rules for **comparability in EU policy**, including:

- Defined impact categories
- Normalisation and weighting
- EF-compliant datasets



European Platform on LCA - ILCD

International Reference Life Cycle Data System (ILCD) Handbook – Key concepts

Three archetypes of LCA questions:

- "Micro-level decision support": Life cycle based decision support on micro-level, i.e. typically for questions related to specific products. "Micro-level decisions" are assumed to have limited and no structural consequences outside the decision-context, i.e. they are supposed not to change available production capacity.
- "Meso/macro-level decision support": Life cycle based decision support at a strategic level (e.g. raw materials strategies, technology scenarios, policy options). "Meso/macro-level decisions" are assumed to have structural consequences outside the decision-context, i.e. they are supposed to change available production capacity.
- "Accounting": Purely descriptive documentation of the system's life cycle under analysis (e.g. a product, sector, or country), without being interested in any potential additional consequences on other parts of the economy.



European Platform on LCA - ILCD

International Reference Life Cycle Data System (ILCD) Handbook – Key concepts

Life cycle models:

- The **attributional life cycle model** depicts its actual or forecasted specific or average supply-chain plus its use and end-of-life value chain. The existing or forecasted system is embedded into a static technosphere.
- The **consequential life cycle model** depicts the generic supply-chain as it is theoretically expected in consequence of the analysed decision. The system interacts with the markets and those changes are depicted that an additional demand for the analysed system is expected to have in a dynamic technosphere that is reacting to this additional demand.

EF Reference package

Environmental Footprint reference packages contain ILCD-formatted zip packages with reference flow lists, LCIA methods and other related XML Files. The reference packages' content is also available as excel table, and change logs in comparison with previous releases are available. <https://eplca.jrc.ec.europa.eu/LCDN/developerEF.xhtml>

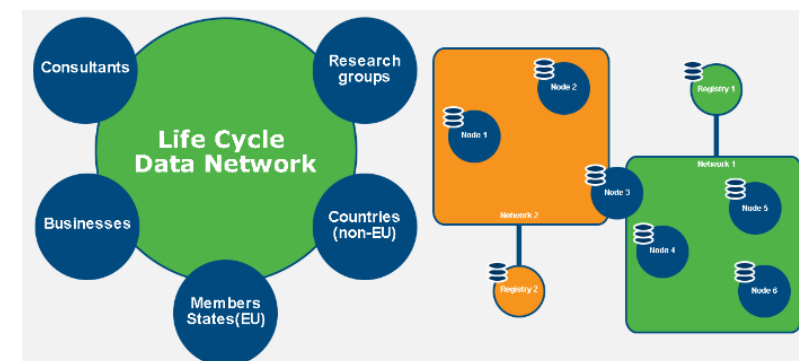


European Platform on LCA - ILCD

International Reference Life Cycle Data System (ILCD) Handbook

ILCD Data Network

- <https://eplca.jrc.ec.europa.eu/LCDN/index.xhtml>
- The Life Cycle Data Network (**LCDN**) was launched in 2014. It aims to provide a globally usable infrastructure for the publication of quality assured LCA dataset (i.e. LCI datasets and LCIA method datasets) from different organizations.
- Main features of the LCDN are:
 - The datasets in the **LCDN** are published by the developer/owner through their own **Node**.
 - Datasets registered can be searched and then browsed directly from the relative Node in the network.
 - All datasets registered and published are compliant with quality requirements aimed at guaranteeing datasets quality and coherence in terms of Methodology, Documentation, and Nomenclature, for the two compliance systems allowed (**ILCD entry level** and **PEF/OEF**)





Environmental Footprint of Critical Raw Materials

Regulation 2024/1252/EU

establishing a framework for ensuring a secure and sustainable supply of critical raw materials (Critical Raw Materials Act)

Standardised, science-based tool to assess the environmental impacts of **CRMs**.

Currently **voluntary**, but provides a framework to **prioritise low-impact** CRMs.

Scope:

- Based on **1 kg of CRM**
- **Excludes** use-phase and end-of-life impacts

System boundaries:

- **Primary CRM:** Extraction → refining, logistics, emissions, waste
- **Secondary CRM:** Scrap → smelting, refining, transport

Impact Categories:

- Climate, water, land use, toxicity, etc. (no normalisation/weighting)

Environmental Performance Classification

- CRMs assigned to **classes (A = lowest impact)**
- Thresholds based on market data, tech progress, and reviewed every **3 years**.

Greenhouse Gas (GHG) related methods and standards



GHG related method and standards

ISO 14060 series

This series provides clarity and consistency for quantifying, monitoring, reporting and validating or verifying GHG emissions and removals to support sustainable development through low-carbon economy and to benefit organizations. It helps organizations:

- Develop and implement **GHG management strategies and plans**
- Develop and implement **mitigation actions** (reductions and removals)
- **Track performance** and progress on GHG reduction and/or removals
- Enhance the **environmental integrity** of GHG quantification
- Improve the **credibility, consistency and transparency** of GHG-related data and reporting

Applications include:

- **Corporate decision-making** (e.g. identifying reduction opportunities, improving energy efficiency)
- **Carbon risk management** (e.g. identifying and addressing climate-related risks and opportunities)
- **Voluntary initiatives** (e.g. GHG registries, sustainability reporting)
- **GHG markets** (e.g. buying/selling of emissions allowances or carbon credits)
- **Regulatory/government programmes** (e.g. national reporting, early action credit systems)

Compatible with the GHG Protocol, CDP, SBTi, and other ESG frameworks.

Complements the CSRD's ESRS, particularly E1 and E2 (Climate change and Emissions).

ISO 14060 Series – GHG Management Standards and carbon footprint

2018 and 2019 updates

This series provides clarity and consistency for quantifying, monitoring, reporting and validating or verifying GHG emissions and removals to support sustainable development through low-carbon economy and to benefit organizations.

Compatible with the GHG Protocol, CDP, SBTi, and other ESG frameworks.

Complements the CSRD's ESRS, particularly E1 and E2 (Climate change and Emissions).

Enables credible climate reporting

- **ISO 14064 – 1 : 2018**

*Specification with guidance at the **organization level** for quantification and reporting of greenhouse gas emissions and removals.*

- **ISO 14064 – 2 : 2019**

*Specification with guidance at the **project level** for quantification, monitoring and reporting of greenhouse gas emission reductions or removal enhancements.*

- **ISO 14064 – 3 : 2019**

*Specification with guidance for the verification and validation of **greenhouse gas statements**.*

- **ISO 14067 : 2019**

Carbon footprint of products quantification and reporting, in a manner consistent with International Standards on LCA (ISO 14040 and ISO 14044).

- **ISO/CD 14060 – (Under development – Committee Draft)**

Net Zero Aligned Organizations

This upcoming standard will provide guidance for organizations on aligning with net-zero targets, including the treatment of residual emissions, offsets, and governance. It will complement existing standards such as ISO 14064 and 14067, and is expected to align with frameworks like the SBTi and CSRD.

GHG related method and standards

ISO 14060 series

ISO 14064-1: 2018

*Greenhouse gases Part 1: Specification with guidance at the **organization level** for quantification and reporting of greenhouse gas emissions and removals*

principles and requirements at the organization level for the quantification and reporting of greenhouse gas (GHG) emissions and removals. It includes requirements for the design, development, management, reporting and verification of an organization's GHG inventory.

ISO 14064-2: 2019

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

principles and requirements and provides guidance at the project level for the quantification, monitoring and reporting of activities intended to cause greenhouse gas (GHG) emission reductions or removal enhancements. It includes requirements for planning a GHG project, identifying and selecting GHG sources, sinks and reservoirs (SSRs) relevant to the project and baseline scenario, monitoring, quantifying, documenting and reporting GHG project performance and managing data quality.

GHG related method and standards

ISO 14060 series

ISO 14064-3:2019

*Greenhouse gases Part 3: Specification with guidance for the verification and validation of **greenhouse gas statements***

specifies principles and requirements and provides guidance for verifying and validating greenhouse gas (GHG) statements.

ISO/TR 14069:2013

Greenhouse gases — Quantification and reporting of greenhouse gas emissions for organizations — Guidance for the application of ISO 14064-1. To be replaced by ISO 14064-4.

ISO/CD 14060

Net Zero Aligned Organizations. Under development – Committee Draft.

This upcoming standard will provide guidance for organizations on aligning with net-zero targets, including the treatment of residual emissions, offsets, and governance. It will complement existing standards such as ISO 14064 and 14067, and is expected to align with frameworks like the SBTi and CSRD.

GHG related method and standards

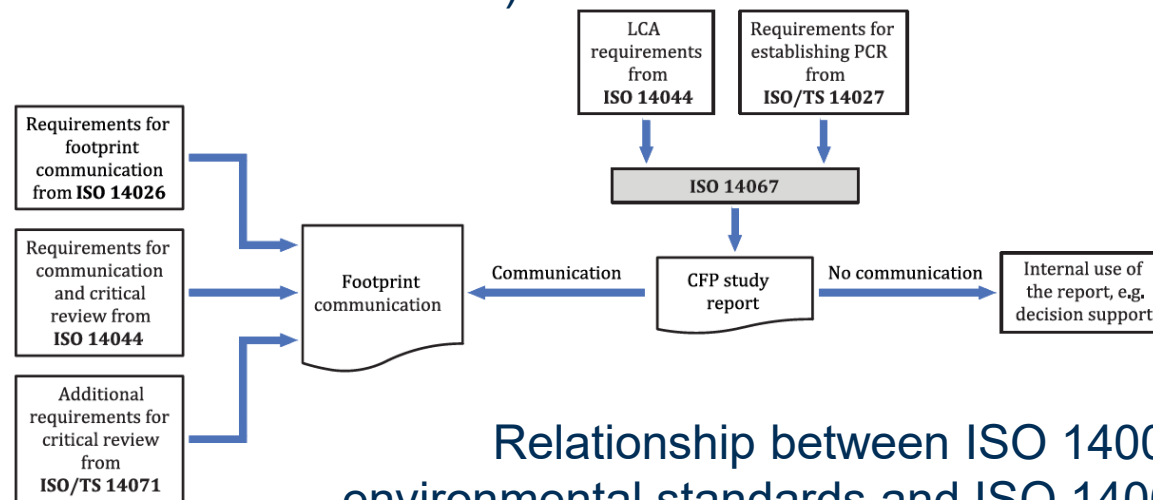
ISO 14060 series

ISO 14067: 2018

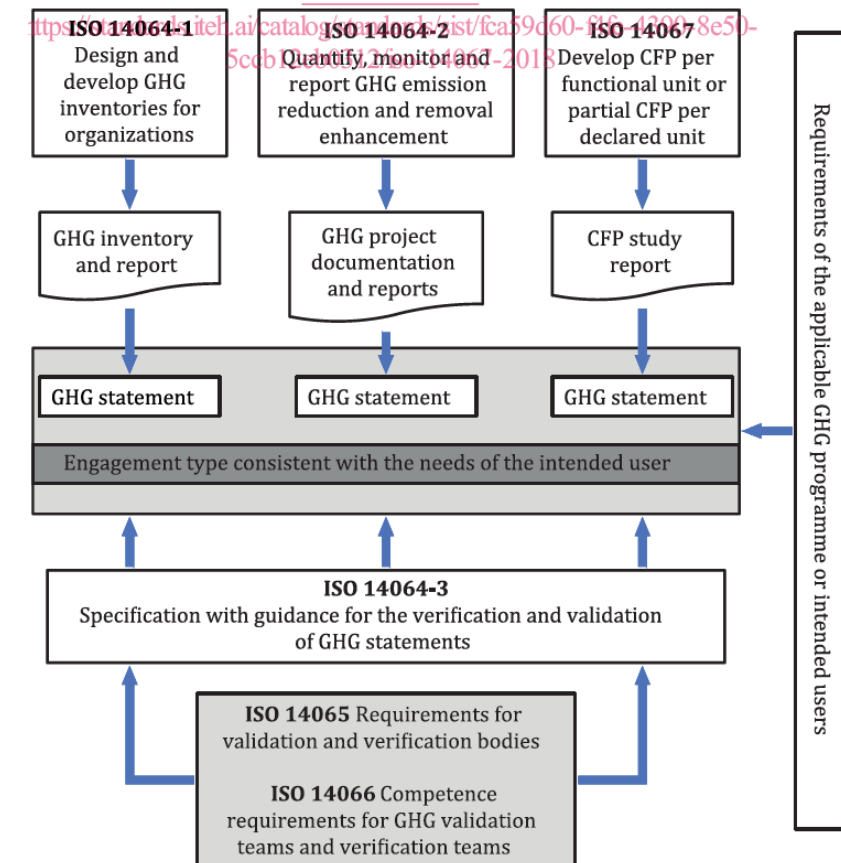
Greenhouse gases – Carbon footprint of products

– *Requirements and guidelines for quantification*

principles, requirements and guidelines for the quantification and reporting of the carbon footprint of a product (CFP), in a manner consistent with International Standards on life cycle assessment (LCA) (ISO 14040 and ISO 14044).



Relationship between ISO 14000 environmental standards and ISO 14060 series



GHG related method and standards

ISO 14060 series

ISO 14068-1: 2023

Climate change management — Transition to net zero Part 1: Carbon neutrality

principles, requirements, and guidance for **achieving and demonstrating carbon neutrality**. It focuses on quantifying, reducing, and offsetting carbon footprints, utilizing a hierarchical approach prioritizing direct and indirect GHG emission reductions and removal enhancements within the value chain over offsetting.

IWA 42:2022

Net zero guidelines

guiding principles and recommendations to enable a common, global approach to achieving net zero greenhouse gas emissions through alignment of voluntary initiatives and adoption of standards, policies and national and international regulation.

GHG related method and standards

Greenhouse Gas Protocol

Launched in 1998 as a joint initiative between World Resource Institute (WRI): <https://www.wri.org/> and the World Business Council for Sustainable Development (WBCSD): <https://www.wbcsd.org/>

Product Life Cycle Accounting and Reporting Standard

- Global framework for measuring and managing product-level GHG emissions
- Developed for **public and private sectors**
- Focus on cradle-to-grave GHG accounting across value chains

Purpose

- **Measure and report** GHG emissions/removals associated with a specific product
- Covers **full product life cycle** (production, use, end-of-life)
- Supports **informed emission reduction decisions**
- Enables organisations to **set reduction targets** and **track progress**
- **Complements the CSRD's ESRS E1 (climate change) and E2 (pollution) disclosures**

GHG coverage: Kyoto protocol

Carbon dioxide (CO₂), Methane (CH₄), Nitrous oxide (N₂O), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), Sulphur hexafluoride (SF₆)

GHG related method and standards

Greenhouse Gas Protocol - Standards

Standard	Scope / Purpose
Corporate Standard	Quantifies Scope 1 and 2 emissions for an organisation
Scope 3 Standard	Quantifies Scope 3 (value chain) emissions
Product Standard	Measures product-level cradle-to-grave GHG emissions
Project Protocol	Quantifies emission reductions from GHG mitigation projects

Standards & guidance: free download

- Corporate Standard: <https://ghgprotocol.org/corporate-standard>
- Product Standard: <https://ghgprotocol.org/product-standard>
- Corporate Value Chain (Scope 3) Standard: <https://ghgprotocol.org/corporate-value-chain-scope-3-standard>
- Scope 2 guidance: <https://ghgprotocol.org/scope-2-guidance>
- Scope 3 calculation guidance: <https://ghgprotocol.org/scope-2-guidance>

GHG related method and standards

Greenhouse Gas Protocol – Scope definitions

Scope 1: Direct GHG emissions

- Direct GHG emissions occur from sources that are owned or controlled by the company.
- Direct CO₂ emissions from the combustion of biomass shall not be included in scope 1 but reported separately
- GHG emissions not covered by the Kyoto Protocol shall not be included in scope 1 but may be reported separately.

Scope 2: Electricity indirect GHG emissions

- Scope 2 accounts for GHG emissions from the generation of purchased electricity consumed by the company. Purchased electricity is defined as electricity that is purchased or otherwise brought into the organizational boundary of the company.

Scope 3: Other indirect GHG emission

- Scope 3 is an optional reporting category that allows for the treatment of all other indirect emissions. Scope 3 emissions are a consequence of the activities of the company but occur from sources not owned or controlled by the company.

GHG related method and standards

WBCSD Guidance on Avoided Emissions

Guidance on Avoided Emissions v2.0: Drive Innovations and Scale Solutions Toward Net Zero

Developed by the World Business Council for Sustainable Development (2023)

Provides clarity, credibility, and consistency in how businesses calculate, assess, and report the emissions savings their products and services enable outside their own value chains.

Avoided emissions are reductions outside a company's value chain, enabled by its products or services.

Aims to help businesses drive innovation and scale climate solutions by demonstrating their broader decarbonization impact, **beyond** reducing their own emissions (Scopes 1, 2, and 3).

Companies must pass through three “gates” to claim avoided emissions:

1. Climate Action Credibility: Company must have a robust climate strategy aligned with the latest climate science
2. Latest Climate Science Alignment: Solutions must be consistent with a 1.5°C pathway
3. Contribution Legitimacy: The solution must have a direct and significant decarbonizing impact

Avoided emissions are calculated as the difference between the emissions of a company's solution and the emissions of a reference scenario (the alternative that would have occurred without the solution).

GHG related method and standards

Partnership for Carbon Transparency - PACT

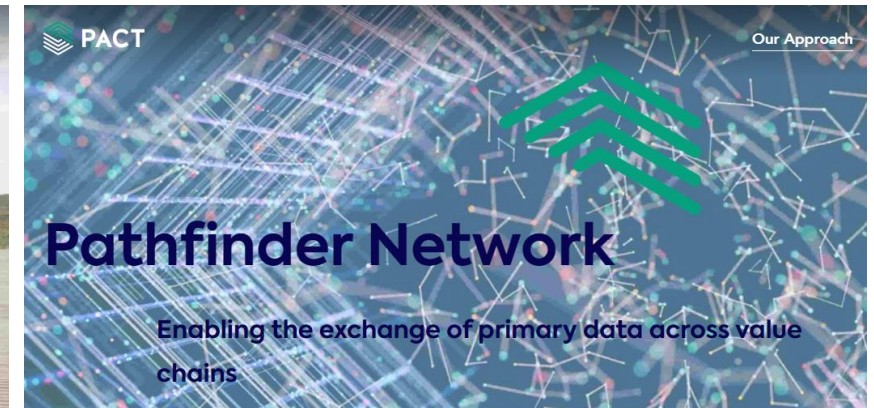
World Business Council for Sustainable Development initiative

<https://www.wbcsd.org/Programs/Climate-and-Energy/Climate/SOS-1.5/News/Partnership-for-Carbon-Transparency-PACT-sets-foundations-for-standardized-emissions-data-exchange>

<https://www.carbon-transparency.com/>

<https://www.carbon-transparency.com/our-approach/pathfinder-framework>

<https://www.carbon-transparency.com/our-approach/pathfinder-network>



GHG related method and standards

Net Carbon Impact Assessment Methodology for ICT Solutions

The European Green Digital Coalition (2024)

Framework to assess and quantify the net climate impact of ICT solutions.

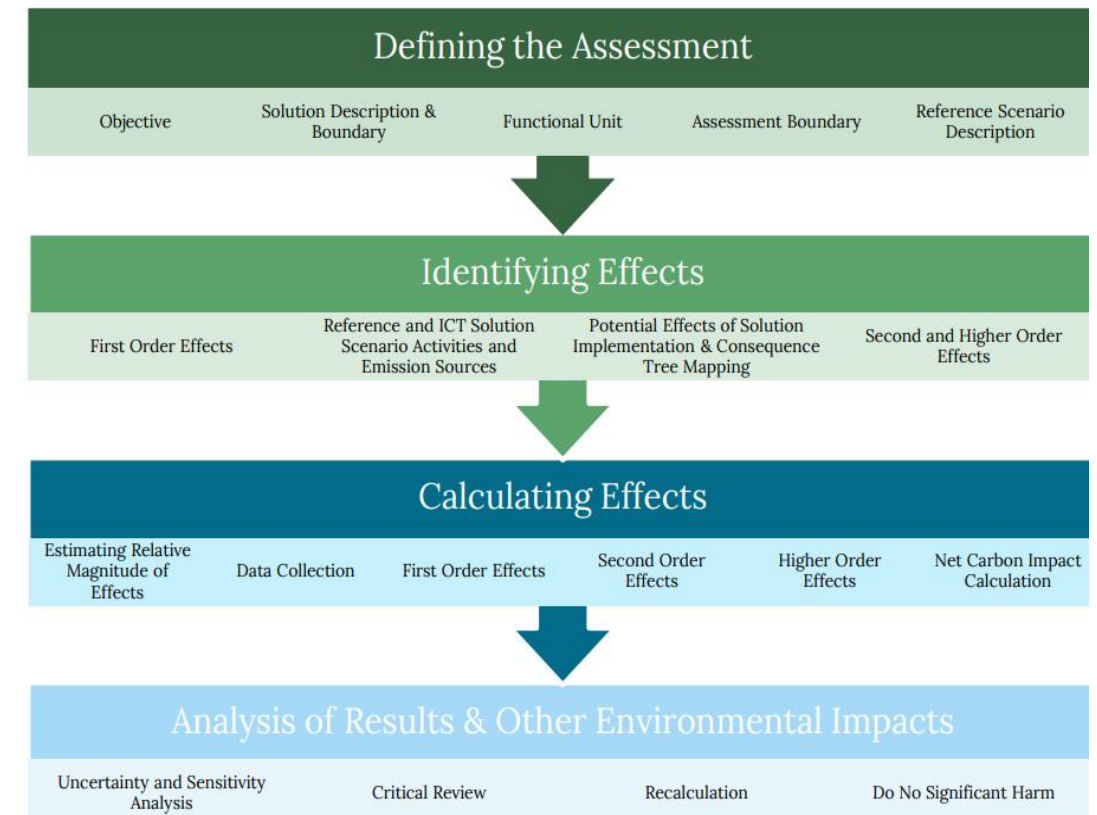
- Identify solutions with a higher net positive environmental impact.

Net carbon impact is determined by comparing emissions of an ICT solution scenario to a reference scenario.

- Considering both direct and indirect effects

Quantifies in CO₂ equivalents:

- Positive contributions (e.g. carbon reductions)
- Negative contributions (e.g. ICT solution's footprint)



Corporate responsibility and reporting



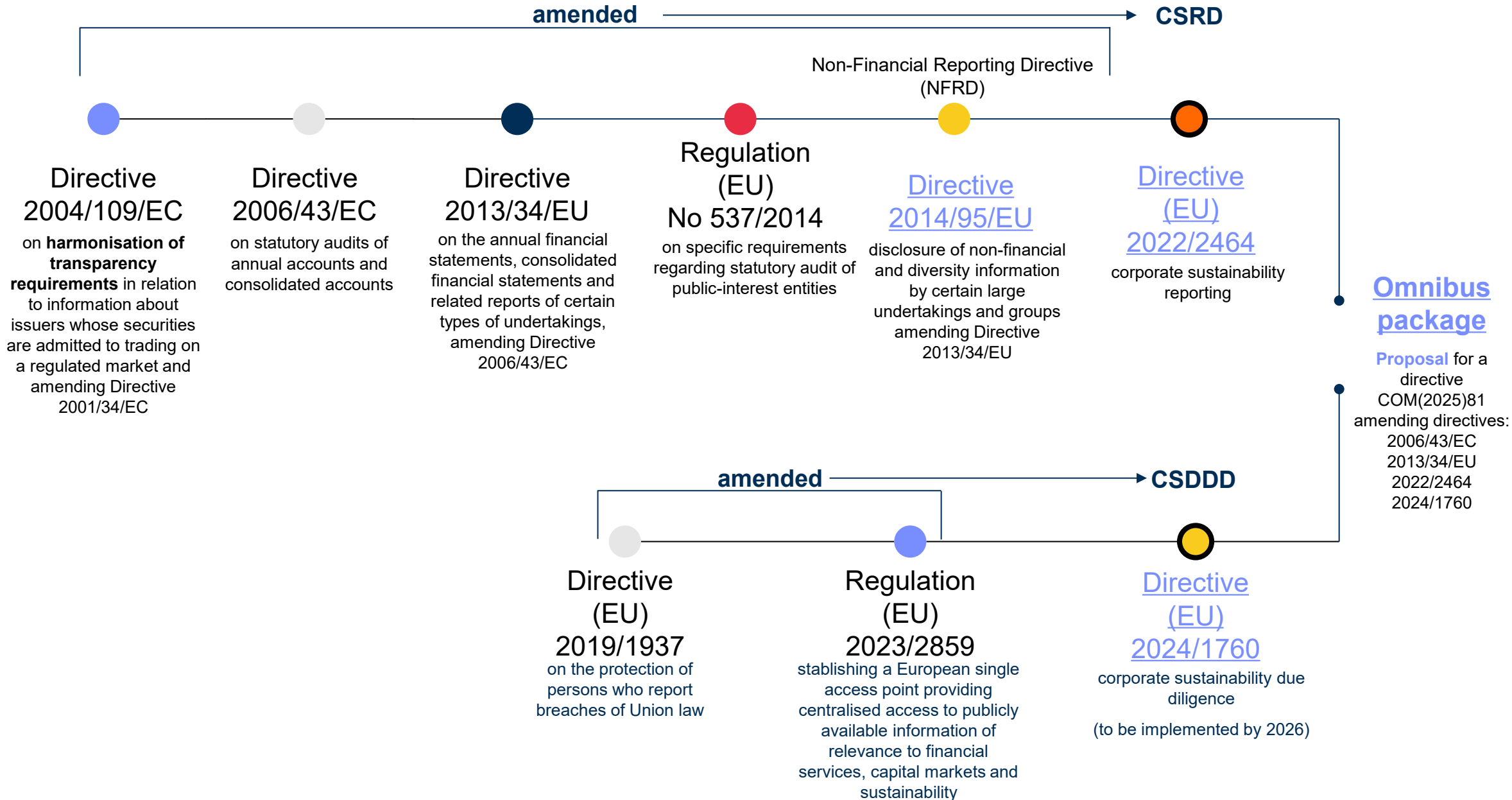
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Development of Sustainability Reporting Directives in the EU





Non-Financial Reporting Directive (NFRD)

Directive 2014/95/EU

disclosure of non-financial and diversity information by certain large undertakings and groups

No longer in force: replaced by the CSRD in 2024

Requires large entities to disclose certain non-financial and diversity information in annual report.

Aims to enhance transparency, accountability, and comparability in corporate sustainability.

Applied to:

- Listed companies with more than 500 employees.
- Public interest companies like banks and insurance companies (including subsidiaries).

Companies must disclose in their management reports (or a separate sustainability report) information related to:

- Environmental matters
- Social and employee-related matters
- Respect for human rights
- Anti-corruption and bribery
- Diversity on company boards



Corporate Sustainability Reporting Directive and ESRS

Directive (EU) 2022/2464

Corporate sustainability reporting

- New EU regulation for mandatory sustainability reporting.
- Applies to large EU and non-EU companies with €50M turnover, >€25M assets, or >250 employees (changed since Omnibus).
- Requires standardised digital reporting of ESG data.
- Companies that fall under the scope of the CSRD have to report in their annual reports to what extent their activities are covered by the EU Taxonomy (**Taxonomy-eligibility**) and comply with the criteria set in the Taxonomy delegated acts (**Taxonomy-alignment**).
- Supported by the European Financial Reporting Advisory Group (EFRAG)
- To be supported by European Sustainability Reporting Standards (ESRS). Under development by EFRAG.
- Single electronic reporting format per (EU) 2019/815 Art. 3

Corporate Sustainability Reporting Directive and ESRS

Delegated Regulation (EU) 2023/2772

Sustainability reporting standards (ESRS)

- Framework of **12 standards** for CSRD compliance.
- **2 General (cross-cutting) Standards:**
 - ESRS1 – sets general reporting rules without disclosure requirements.
 - ESRS2 – outlines mandatory disclosures for all CSRD-covered companies regardless of the topic.
- **10 Topical Standards**
 - Requires materiality assessments and quantified disclosures
 - **Environmental (E1–E5):** Climate change, pollution, water and marine resources, biodiversity, circular economy and resource use.
 - **Social (S1–S4):** Workforce, value chain workers, affected communities, consumers and end-users.
 - **Governance (G1):** Business conduct, e.g., business ethics, anti-corruption, political influence).

Group	Number	Subject
Cross-cutting	ESRS 1	General Requirements
Cross-cutting	ESRS 2	General Disclosures
Environment	ESRS E1	Climate
Environment	ESRS E2	Pollution
Environment	ESRS E3	Water and marine resources
Environment	ESRS E4	Biodiversity and ecosystems
Environment	ESRS E5	Resource use and circular economy
Social	ESRS S1	Own workforce
Social	ESRS S2	Workers in the value chain
Social	ESRS S3	Affected communities
Social	ESRS S4	Consumers and end users
Governance	ESRS G1	Business conduct



EU Taxonomy Regulation

Regulation (EU) 2020/852

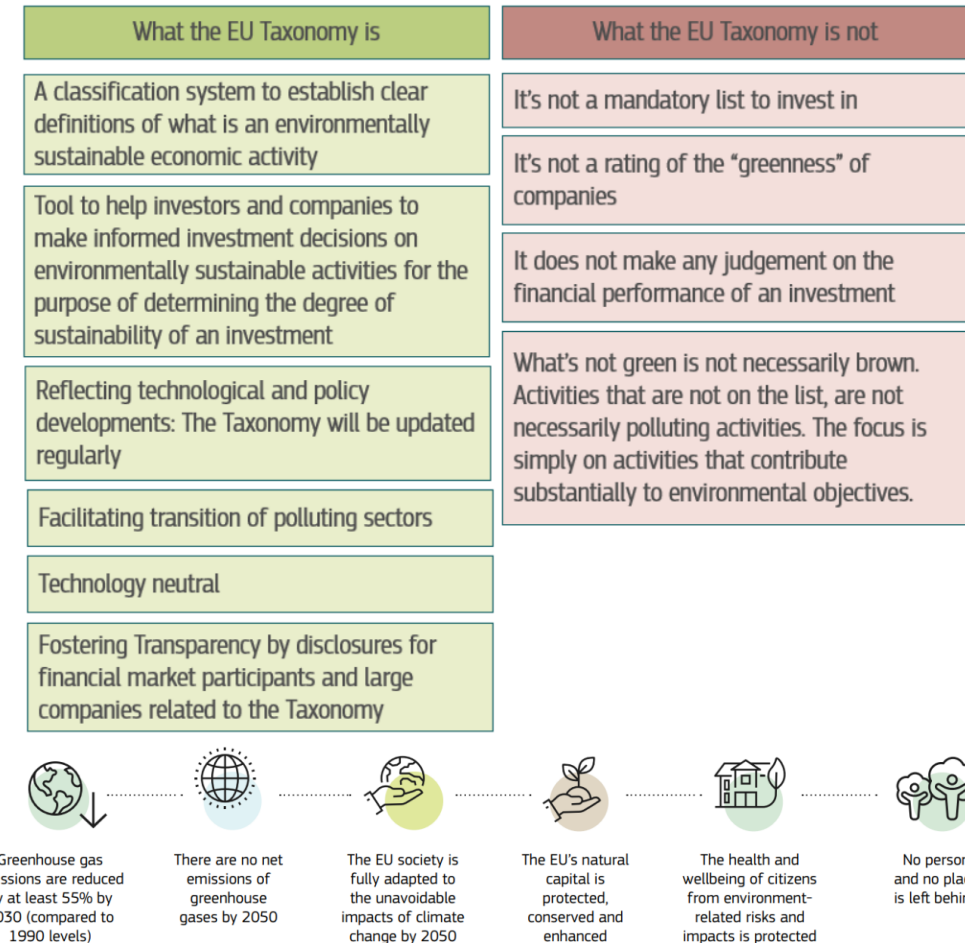
On the establishment of a framework to facilitate sustainable investment (amends Regulation (EU) 2019/2088)

- Classification framework developed to help **companies, investors, and policymakers**
- Identify which economic activities can be considered **environmentally sustainable**.

Environmentally sustainable economic activities are described as those which “make a substantial contribution to at least one of the EU’s climate and environmental objectives”, while at the same time not significantly harming any of these objectives and meeting minimum social safeguards.

Goal:

- Direct capital flows toward sustainable investments.
- Support the **European Green Deal**.
- Facilitate the **EU’s transition to climate neutrality by 2050**.



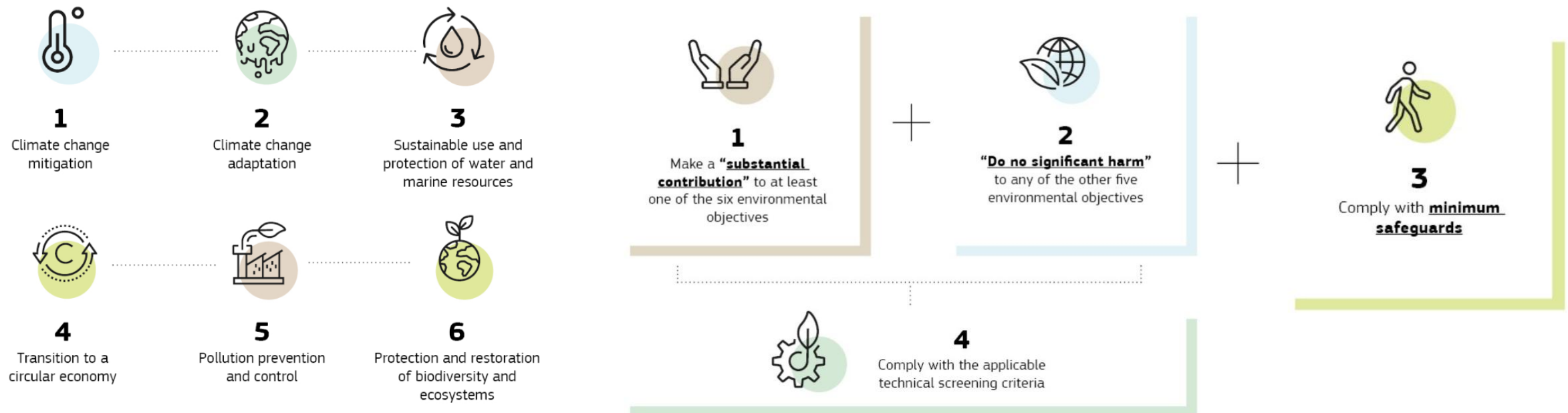


EU Taxonomy Regulation

EU taxonomy regulation (EU) 2020/852

The taxonomy regulation sets out six climate and environmental objectives.

Four overarching conditions that an economic activity must meet in order to qualify as environmentally sustainable





EU Taxonomy

Regulation (EU) 2020/852 – Delegated acts

- Commission Delegated Regulation (EU) 2021/2139 of 4 June 2021 supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council by establishing the technical screening criteria for determining the conditions under which an economic activity qualifies as contributing substantially to climate change mitigation or climate change adaptation and for determining whether that economic activity causes no significant harm to any of the other environmental objectives.
- Commission Delegated Regulation (EU) 2021/2178 of 6 July 2021 supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council by specifying the content and presentation of information to be disclosed by undertakings subject to Articles 19a or 29a of Directive 2013/34/EU concerning environmentally sustainable economic activities, and specifying the methodology to comply with that disclosure obligation.
- Commission Delegated Regulation (EU) 2022/1214 of 9 March 2022 amending Delegated Regulation (EU) 2021/2139 as regards economic activities in certain energy sectors and Delegated Regulation (EU) 2021/2178 as regards specific public disclosures for those economic activities.



EU Taxonomy Regulation

EU taxonomy regulation (EU) 2020/852 – Manufacture of EEE

Based on Climate Delegated Act (Regulation (EU) 2021/2139), Annex I, Section 3.6

Under the **EU Taxonomy Climate Delegated Acts** (and updates), specific technical screening criteria were developed for multiple sectors, including the **manufacture of electrical and electronic equipment (EEE)**.

To be fully taxonomy-aligned, activities must:

- Substantially contribute to at least **one of the six environmental objectives**
- Do No Significant Harm (DNSH) to the **other five** objectives
- Respect Minimum Social Safeguards (OECD Guidelines, UN Guiding Principles)

Substantial contribution criteria (to be environmentally sustainable under the EU Taxonomy)



Corporate Sustainability Reporting

EU taxonomy regulation (EU) 2020/852 – Manufacture of EEE

Compliance options:

1. If **EU Ecolabel criteria** exist for a product category (per Regulation (EC) 66/2010), compliance must be demonstrated through the verification criteria defined by the EU Ecolabel.

Where the economic activity manufactures electrical and electronic equipment complying with all EU Ecolabel criteria applicable to that specific product category, in accordance with Regulation (EC) 66/2010 of the European Parliament and of the Council⁽²¹⁾, the operator of the activity provides the proof of compliance with all requirements listed, in accordance with the verification criteria foreseen by the EU Ecolabel criteria.

2. Where no product specific EU Ecolabel criteria exist, or the operator of the activity has not used them, the economic activity manufacturing electrical and electronic equipment complies with all of the following criteria applicable to a relevant product:
 1. Design for long lifetime
 2. Design for repair and guarantee
 3. Design for reuse and remanufacturing
 4. Design for dismantling
 5. Design for recyclability
 6. Proactive substitution of hazardous substances
 7. Information to customers
 8. Producer responsibility



Corporate Sustainability Due Diligence Directive

Directive (EU) 2024/1760

corporate sustainability due diligence and amending Directive (EU) 2019/1937 and Regulation (EU) 2023/2859 - Implementation scheduled in 2026

The directive aims to foster sustainable and responsible corporate behaviour throughout global value chains. **Identify, prevent, mitigate, and remediate** human rights and environmental risks across **value chains**.

Applies to **large companies** operating in the EU (>500 employees, >150M€ turnover) and large undertakings of high impact sectors (>250 employees, >40M€ turnover, e.g. textile). **SMEs impacted indirectly** via value chains.

Risk Mapping and Assessment

- Identify high-risk areas in **own operations, subsidiaries, suppliers, partners (upstream and downstream)**.

Action Plans and Prevention Measures

- Develop **prevention/corrective action plans** with timelines and indicators.
- Engage stakeholders (e.g., **rights-holders, NGOs**) in the due diligence process.

Remediation Obligations

- Company **causes/contributes to harm**, they must provide **remediation** (e.g., compensation, damage repair).

Monitoring and Reporting

- Ongoing effectiveness checks (Adjust plans as needed with **periodic reassessments**).
- **Public reporting** on due diligence activities and outcomes.

Enforcement handled by **national authorities, penalties** for non-compliance.



EU Omnibus Package

Proposal for directive COM(2025)81 – Provisional agreement December 2025

Consolidates and amends existing sustainability-related directives and regulations, notably the CSRD, the CSDDD, and the EU Taxonomy Regulation.

- Cutting regulatory burdens by 25% for large companies and 35% for SMEs.
- Preserves objectives of EU sustainability legislation, with emphasis on manageable compliance.

Timeline change ('Stop-the-Clock directive'). → Transposition by MS required by 31/12/2025 (transposed by Belgium on 12 December 2025)

- Wave 1: No change - large companies subject to NFRD, report in 2025 for the FY 2024.
- Wave 2: Large non-listed companies (250+ employees or €40M turnover) until 2028 to report FY 2027 (previously 2026 for FY 2025). (act postpones the application of the upcoming CSRD-requirements for two years)
- Wave 3: SMEs public interest companies now report on the 2028 financial year in 2029 (previously 2026 in 2027).
- Wave 4: No change for non-EU companies operating in the EU; they must report for FY 2028 in 2029.



EU Omnibus Package

Proposal for directive COM(2025)81 – Provisional agreement December 2025

Narrowing the scope of CSRD to companies:

- 1000 employees and either € 450 M in turnover or ~~€25M in assets (removing 80% of companies from threshold)~~.

Exemption for “wave 1” undertakings. The stricter cumulative thresholds will come into effect for “wave 1” undertakings in financial years starting on or after 1 January 2027. This means that they will have to continue to report on sustainability matters for previous financial years. However, Member States may opt to exempt them, in consideration of the fact that most of these undertakings will fall out of scope as of 2027.

- The rules will also apply to non-EU companies with net turnover in the EU of over €450 million and to their subsidiaries and branches generating turnover higher than €200 million in the EU.
- Due diligence rules (CSDDD) will only apply to firms with >5,000 employees and > €1.5 B turnover, from July 2029.
- Sector-specific reporting will become voluntary

The directive will enter into force twenty days after its publication in the Official Journal (expected early to mid-2026)



EU Green Claims Directive

Directive proposal EU 2023/0085/COD (2023)

On substantiation and communication of explicit environmental claims (Green Claims Directive)

Proposed legislative framework designed to combat greenwashing by setting strict rules for how companies substantiate and communicate voluntary environmental claims about their products, services, or operations.

- Ensures consumers can trust environmental claims and make informed, sustainable choices.

It affects:

- All companies operating in the EU that make voluntary environmental claims to consumers.
- Small and medium-sized enterprises (SMEs) are included, but microenterprises are exempt.

It encompasses:

- Any explicit environmental claims (e.g., “climate neutral,” “eco-friendly,” “biodegradable,” “carbon neutral”) that are not already regulated by other EU laws.
- Environmental labelling schemes and ecolabels.

Claims must be specific, accurate, and relevant to the assessed environmental impact, aspect, or performance.

Independent reporting initiatives

Global Reporting Initiative (GRI) Standards

Independent, international standards established by a non-profit organization. One of the world's most widely used sustainability reporting standards.

The Global Reporting Initiative (GRI) is an international organization created in 1997 on the initiative of CERES (Coalition for Environmentally Responsible Economies) and the Tellus Institute, in close collaboration with UNEP, the United Nations Environment Programme.

It was the first major global initiative to create standards for the disclosure of CSR information by companies, and was subsequently followed by the CDP, the European Union with the CSRD and more recently the IFRSS with the ISSB.

Enables organisations worldwide to understand and communicate their impacts on the economy, environment, and society, using a standardized, transparent.

Provides a framework (GRI Standards) helping organizations measure, manage, and report their ESG impacts. This supports transparency, stakeholder trust, and accountability, and helps organisations identify material issues, set targets, and track progress.

Modular and consists of three main types:

- The GRI Universal Standards (applies to all organizations)
- The GRI Sector Standards (applicable to specific sectors)
- GRI Topic Standards (each listing disclosures relevant to a particular topic)

Independent reporting initiatives

GRI Standards Compared to the CSRD

Aspect	GRI Standards	ESRS (CSRD)
Scope and Regulations	Voluntary, global framework	Mandatory for certain EU and non-EU companies
Format and Framework	Flexible, modular, principle-based approach	Prescriptive and structured
Materiality	Focuses on impact materiality (effect of company on people, environment).	Uses double materiality (impact materiality + financial materiality).
Compatibility	Aims for global compatibility, used across many industries.	Aligned with EU Taxonomy, EU regulations, and designed for EU context.
Topics Covered	Environmental, social, governance, human rights, and economic impacts	Similar topics but with added focus on aligning with EU regulations

Independent reporting initiatives

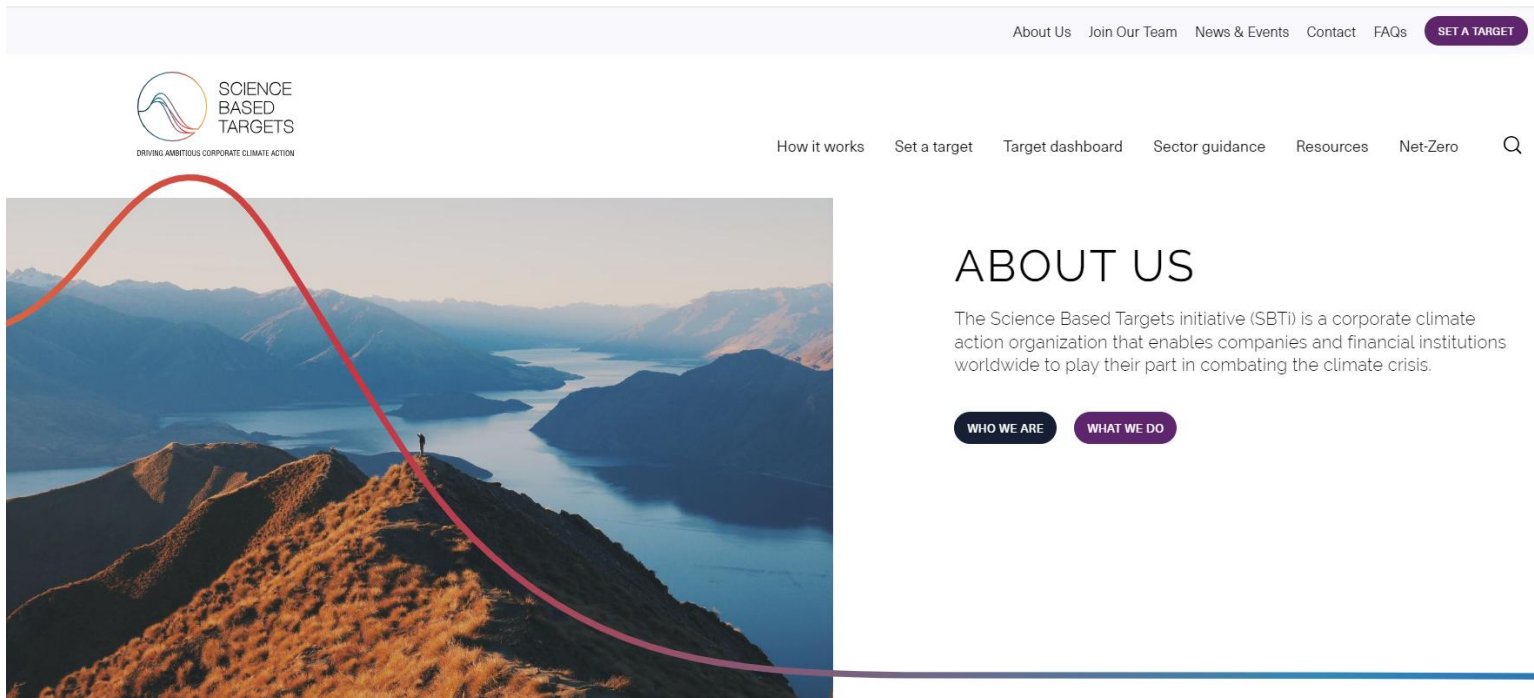
Science Based Targets initiative (SBTi)

The Science Based Targets initiative (SBTi) is a corporate climate action organization that enables companies and financial institutions worldwide to play their part in combating the climate crisis.

- **Global initiative** that provides a **guidance framework** developing standards and tools to guide companies in setting **GHG emissions reductions targets** aligned with the goals of the Paris agreement and to reach net-zero by 2050.
- **A verification body** that assesses whether the targets are science-based, ambitious enough and consistent with global carbon budgets.
- It offers both **cross-sectorial and sector-specific** methods and tools.
- SBTi provides a **Net-Zero Standard**, the first global framework for corporate net-zero target-setting.
- To be in line with SBTi Criteria, companies must set scope 3 targets if these are significant (represent 40% total emissions). These supplier engagement targets and/or reduction targets should collectively cover at least 67% of total scope 3 emissions.

Independent reporting initiatives

Science Based Targets initiative (SBTi)



The SBTi was formed as a collaboration between CDP, the United Nations Global Compact, World Resources Institute (WRI) and the World Wide Fund for Nature (WWF). In 2023 it was incorporated as a charity in the UK, with a legal Board of Trustees. The SBTi also incorporated a subsidiary which will, when fully operational, house its target validation services, with all profits donated to the charity. Standard-setting will remain in the charity.



The Science Based Targets initiative:

- Defines and promotes best practice in emissions reductions and net-zero targets in line with climate science.
- Develops standards, tools and guidance to enable companies and financial institutions to set science-based targets in line with the latest climate science.
- Through its validation services arm, assesses and validates companies' and financial institutions' targets

Independent reporting initiatives

Science Based Targets initiative (SBTi)



About Standards and guidance Target services Target dashboard Resource library Contact



THE CORPORATE NET-ZERO STANDARD

The SBTi's Corporate Net-Zero Standard provides the guidance and tools companies need to set science-based net-zero targets.

SET A NET-ZERO TARGET

READ THE CORPORATE NET-ZERO STANDARD



SBTi CORPORATE NET-ZERO STANDARD

Version 1.2

March 2024

Purpose of the Net-Zero Standard

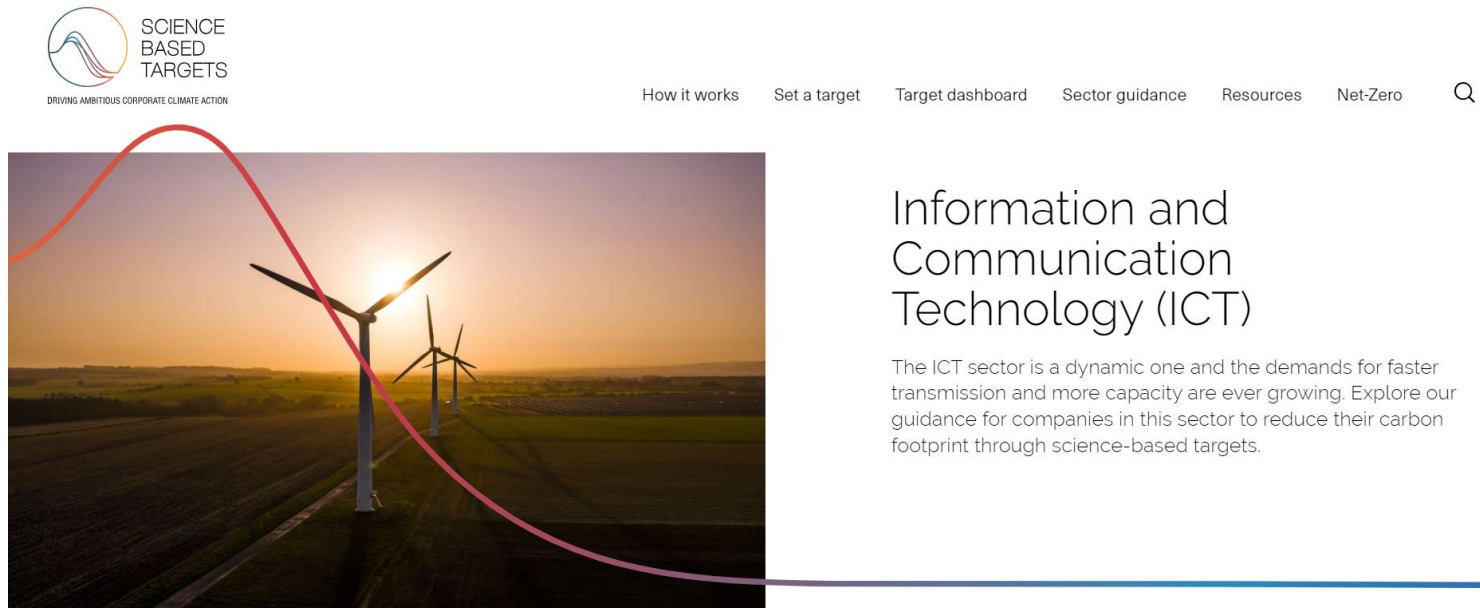
The SBTi's Corporate Net-Zero Standard (also referred to as the 'Net-Zero Standard') contains guidance, criteria, and recommendations to support corporates in setting net-zero targets to be validated by the SBTi. The main objective of this standard is to provide a standardized and robust approach for corporates to set net-zero targets aligned with climate science.

It is important to note that while the SBTi does provide some supplementary guidance on greenhouse gas (GHG) accounting, companies should refer to the suite of corporate Greenhouse Gas Protocol standards on this topic.

Independent reporting initiatives

Science Based Targets initiative (SBTi)

ICT sector guidance



Guidance for the ICT sector

Historically, the ICT sector has been able to meet increasing capacity and speed demands through technological advancement and purchase of renewable electricity. However, as new technologies continue to increase in both size and complexity, this approach needs further efforts. Hence the 1.5°C trajectory is a challenging task, one that will not be able to achieve without significant commitment and ambitious action.

How to set a target

We have published guidance for ICT companies (specifically **mobile network operators, fixed networks operators** and **data center operators**) to set science-based emissions reduction targets.

Environmental management

ISO 14001:2015 and 1:2024

Environmental management systems – Requirements with guidance for use

Will be replaced by ISO/DIS 14001

ISO 14001 – Environmental Management Systems (EMS) – Requirements with guidance for use

- Requires that organizations identify and evaluate the environmental aspects of their products and related activities using a life cycle perspective
- Helps organisations manage environmental impacts, comply with laws, and meet sustainability goals.
- Follows a **Plan-Do-Check-Act (PDCA)** cycle: policy → objectives → processes → monitoring and audits.
- Requires understanding of organisational context, stakeholder needs, and life cycle thinking.
- Supports integration with other standards (e.g., ISO 9001, ISO 45001).

Other 14000 standards include:

ISO 14002-1 and 14002-2 – Guidelines for using 14001 to address environmental aspects and conditions within an environmental topic area (part 1: general, part 2 : water)

ISO 14004:2016 – EMS – General guidelines on implementation

ISO 14005:2019 – EMS – Guidelines for a flexible approach to phased implementation

ISO 14006:2020 – EMS – Guideline on incorporating ecodesign

Eco-design



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ISO standards for eco-design

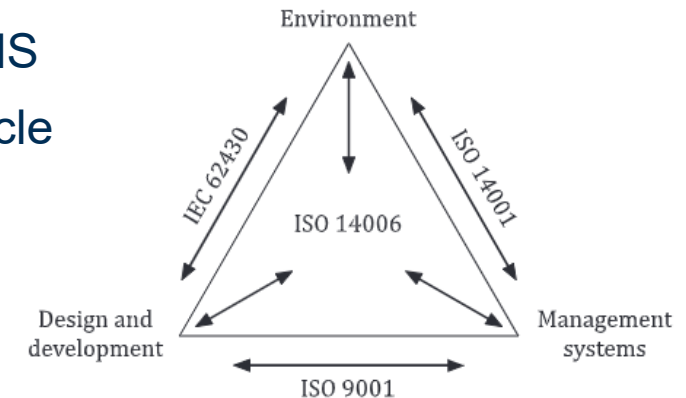
ISO 14006:2020

Environmental management systems — Guidelines for incorporating ecodesign

This document is primarily aimed at organizations that have an environmental management system (EMS), such as that described in ISO 14001, whether or not combined with a quality management system (QMS).

ISO 14006 – Ecodesign Integration into EMS

- Provides guidance for embedding **ecodesign** into ISO 14001-based EMS
- Focuses on reducing product's environmental impacts across the life cycle
- Encourages cross-functional collaboration
- Balances environmental goals with quality, cost, and performance
- Includes planning, training, and setting environmental design criteria
- Continuous review, innovation, and alignment of EMS with sustainability goals



IEC standards for eco-design

IEC 62430:2019

Environmentally conscious design – Principles, requirements and guidance.

Developed by the **International Electrotechnical Commission (IEC)**

- It is a **general standard (broadly applied across industries)** and serves as a **foundational framework** that can be built upon or referenced by more specific standards.
- Technical standard addressing ecodesign at the design level and development level. Is primarily intended for use by technical committees in the preparation of standards in accordance with the principles laid down in IEC Guide 108.
- Describes principles, specifies requirements and provides guidance for organizations intending to integrate environmental aspects into the design and development process of their products in order to minimize the adverse environmental impacts.
- This document applies to processes on how ECD (environmentally conscious design) are integrated into the design and development.

ISO standards for Eco-design

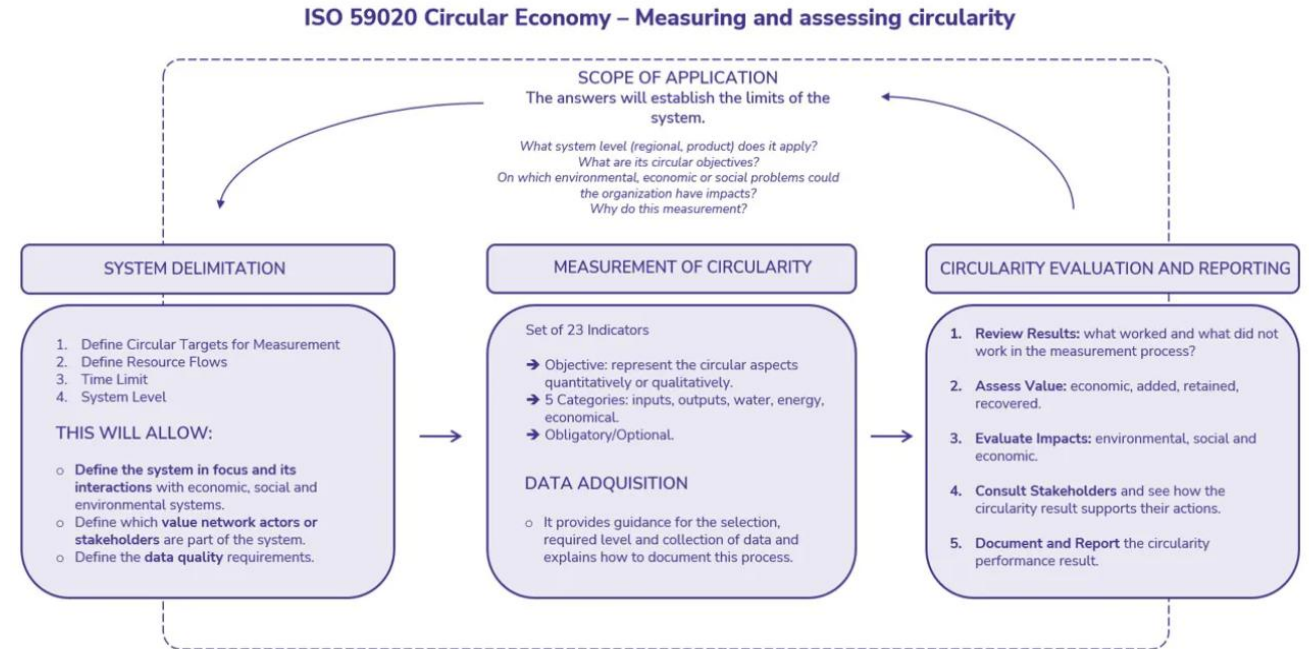
ISO 59020:2024

Circular economy – Measuring and assessing circularity performance

Part of the ISO 59000 series supporting the harmonisation and implementation of the circular economy. Provides a **standardised framework** for measuring circularity performance using a set of core and optional indicators. Ensures **consistency, comparability, and verifiability** of circularity assessments.

Three-stage Assessment Process:

1. Boundary setting
Define the system under analysis
2. Data acquisition and measurement
Specify and collect relevant circularity data
3. Assessment and reporting
Evaluate and interpret results



ISO standards for Eco-design

ISO 59020:2024

Core Circularity Indicators

- **Resource inflow:**
 - Reused content (%)
 - Recycled content (%)
 - Renewable content (%)
- **Resource outflow:**
 - Reused products/components (%)
 - Recycled material (%)
 - Recirculated biological output (%)

Optional indicators: energy, water, and economic aspects (Annex 7.2)

Aligns with CTI and MCI indicators.

To measure and assess social, environmental and economic impacts that are caused by the actions of the organization to achieve circular goals and objectives, the document provides a list of complementary methods that can be used in addition to this document.



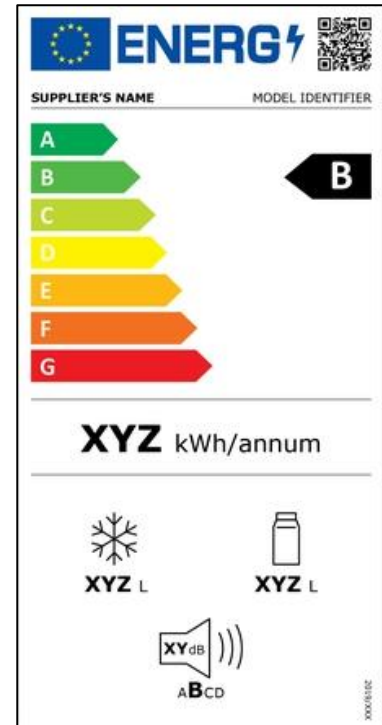
EU Eco-design

Eco-design directive 2009/125/EC

framework for the setting of ecodesign requirements for energy-related products (recast) - to be replaced by ESPR, Regulation (EU) 2024/1781

Established a framework for setting ecodesign requirements primarily for **energy-related products** (> 20 000 units/yr EU market, excl. means of transport), with a focus on improving energy efficiency during the use phase. Methodology for Ecodesign of Energy-related Products (MEErP) (D4.2)

- Energy-related product: any good that has an impact on energy consumption during use.
- 32 energy-efficient product groups: energy saving, labelling, and ecodesign requirements
https://commission.europa.eu/energy-climate-change-environment/standards-tools-and-labels/products-labelling-rules-and-requirements/energy-label-and-ecodesign/energy-efficient-products_en
- Focus: increasing energy-efficiency and protection of environment
- Linked to CE marking





EU Eco-design

ESPR Regulation (EU) 2024/1781

framework for the setting of ecodesign requirements for sustainable products, amending Directive (EU) 2020/1828 and Regulation (EU) 2023/1542 and repealing Directive 2009/125/EC – Environmentally Sustainable Product Regulation (ESPR)

The eco-design directive is amended by the ESPR which encompasses a more extensive regulatory framework that applies to a **wide range of physical goods** placed on the EU market, beyond energy-related products. Intended to facilitate the design of products that contribute to environmental sustainability across their life cycle, including production, use, and end-of-life stages.

Through delegated acts the EC defines specific ecodesign requirements. These consist of:

- (1) Performance-based criteria, *i.e.* product durability, resource efficiency, repairability, recyclability,...
- (2) Information-based provisions which entails disclosure of environmental specification, use of CRMs, life cycle emission data, ...



EU Eco-design

ESPR Regulation (EU) 2024/1781

Applies to nearly all physical goods sold in the EU, except food, feed, and medicinal products

Sets requirements for products:

- Durability, reliability
- Reusability
- Upgradability
- Repairability
- Energy and resource efficiency
- Recycled content
- Reduction of environmental and climate footprints

Regulation covers all lifecycle stages, aiming to reduce waste and promote recycling and remanufacturing.

Puts into place the DPP (digital product passport)

The regulation will be further defined in delegated acts and is not currently fully finalized.



EU Eco-design

ESPR Regulation (EU) 2024/1781

Article 1

Subject matter and scope

1. This Regulation establishes a framework for the setting of ecodesign requirements that products have to comply with to be placed on the market or put into service, with the aim of improving the environmental sustainability of products in order to make sustainable products the norm and to reduce the overall carbon footprint and environmental footprint of products over their life cycle, and of ensuring the free movement of sustainable products within the internal market.

This Regulation also establishes a digital product passport, provides for the setting of mandatory green public procurement requirements and creates a framework to prevent unsold consumer products from being destroyed.

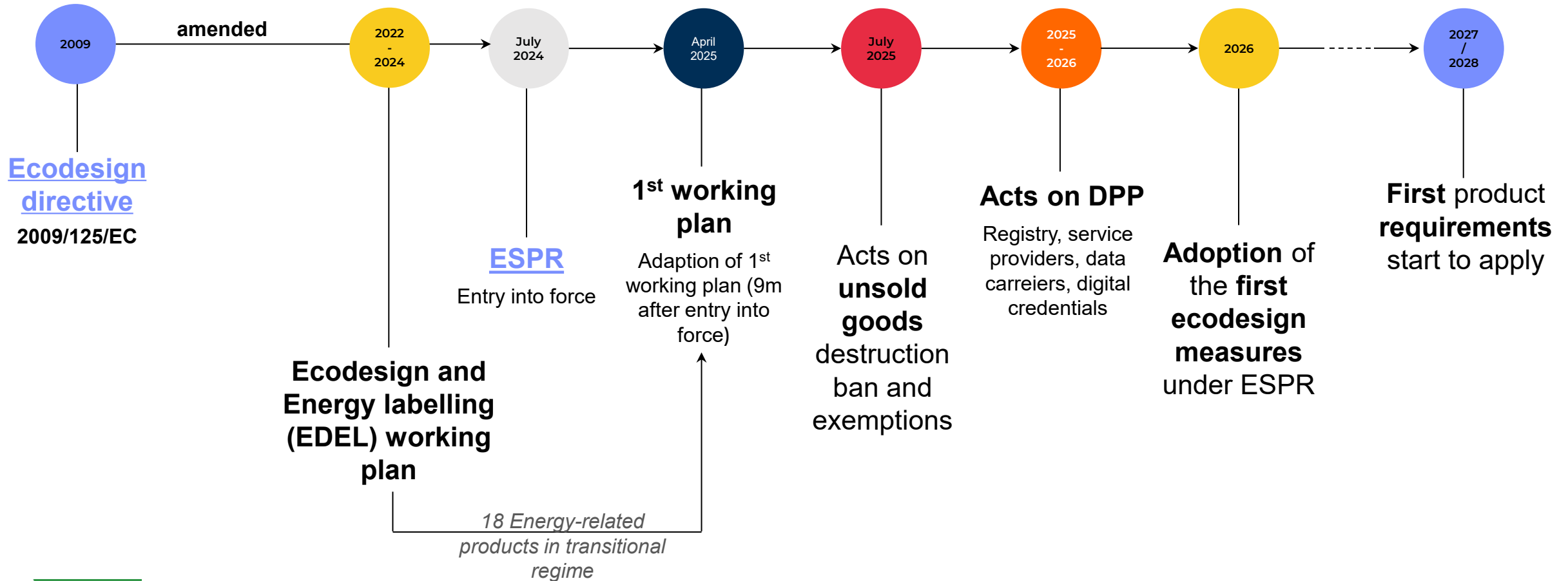
2. This Regulation applies to any physical goods that are placed on the market or put into service, including components and intermediate products. However, it does not apply to:

- | | |
|---|---|
| (a) food as defined in Article 2 of Regulation (EC) No 178/2002; | (e) living plants, animals and micro-organisms; |
| (b) feed as defined in Article 3(4) of Regulation (EC) No 178/2002; | (f) products of human origin; |
| (c) medicinal products as defined in Article 1(2) of Directive 2001/83/EC; | (g) products of plants and animals relating directly to their future reproduction; |
| (d) veterinary medicinal products as defined in Article 4(1) of Regulation (EU) 2019/6; | (h) vehicles as referred to in Article 2(1) of Regulation (EU) No 167/2013, in Article 2(1) of Regulation (EU) No 168/2013 and in Article 2(1) of Regulation (EU) 2018/858, in respect of those product aspects for which requirements are set under sector-specific Union legislative acts applicable to those vehicles. |



EU Eco-design

Implementations of ecodesign-related legislations



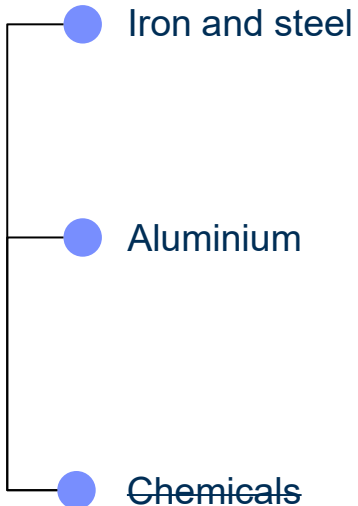


EU Eco-design

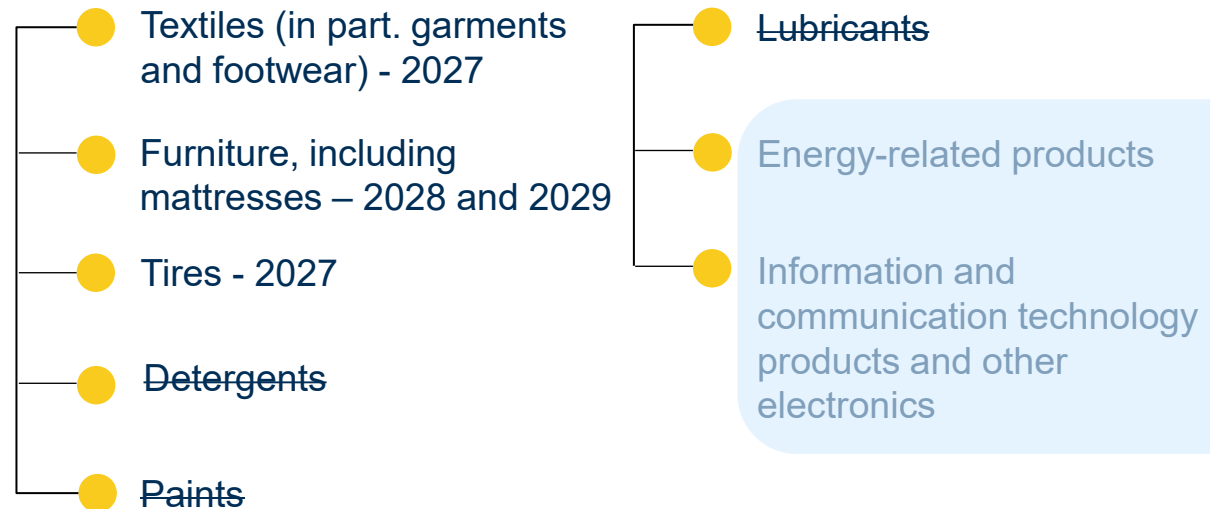
ESPR (EU) 2024/1781 - Article 18 - 1st working plan

- **The working plan** is a strategic document adopted by the European Commission under Article 18 of the ESPR. It defines the **priority product groups** that will be subject to new or updated **ecodesign requirements**, including **horizontal measures** (e.g. on durability or repairability). The plan outlines the scope and **timeline for regulatory development** and ensures transparency in the **selection and justification** of included or excluded product groups.
- WP minimum of 3 years, covering eco-design requirements, including horizontal requirements, and the possible prohibition of destruction of unsold consumer goods.
- First working plan to be adopted in the first 9 months of ESPR implementation and includes:

Intermediate products



Final products



Horizontal requirements: repairability (incl. scoring) - 2027 and recycled content and recyclability of EEE - 2029



EU Eco-design

From eco-design directive to ESPR

Under the Ecodesign Directive 2009/125/EC the **Ecodesign and Energy Labelling Work Plan (EDELWP)** for 2022 - 2024 covers **35 product groups** targeted for **new or revised ecodesign and energy labelling regulations**.

- For the 7 product groups below regulations have been adopted. Hence these regulations remain valid and may be repealed, replaced or updated under the ESPR.

EDELWP 22-24 measures completed					
Product group ⁽¹⁾	Type of measure ⁽²⁾			Reference	Status
	E D	E L	V A		
Mobile phones and tablets	X			Regulation (EU) 2023/1670	Adopted
		X		Regulation (EU) 2023/1669	Adopted
Local space heaters	X			Regulation (EU) 2024/1103	Adopted
Tumble driers	X			Regulation (EU) 2023/2533	Adopted
		X		Regulation (EU) 2023/2534	Adopted
Standby / off mode consumption	X			Regulation (EU) 2023/826	Adopted
Industrial fans	X			Regulation (EU) 2024/1834	Adopted
Simple set-top boxes	X			Regulation (EU) 107/2009	Repealed with effect from 9 May 2025
Game consoles			X	Version 5.1	Adopted

Table 1. Completed items from the EDELWP 2022-24

For example: in case of smartphones and tablets, the EDEL WP led to the adoption of Regulation (EU) 2023/1670, establishing specific ecodesign requirements such as energy efficiency, repairability, and durability...

- (1) Availability of spare parts:
- (a) From 20 June 2025 or from one month after the date of placement on the market, whichever is later, manufacturers, importers or authorised representatives shall make available to professional repairers at least the following spare parts, including required fasteners, if not reusable, until at least 7 years after the date of end of placement on the market, when present:
- (i) battery or batteries;
 - (ii) front-facing camera assembly;
 - (iii) rear-facing camera assembly;
 - (iv) external audio connector(s);
 - (v) external charging port(s);
 - (vi) mechanical button(s);
 - (vii) main microphone(s);
 - (viii) speaker(s);
 - (ix) hinge assembly;
 - (x) mechanical display folding mechanism.



EU Eco-design

From eco-design directive to ESPR Energy-related products

- According to article 79(1)(a)(i) of the ESPR 19 listed products fall under the transitional regime with a view to adopt relevant measures pursuant to the Ecodesign Directive until the end of 2026. Work has subsequently been completed for industrial fans.

Pending work under the EDEL WP 2022-24

► Transitional regime

Industrial fans	External power supplies
Space and combination heaters	Professional refrigeration equipment
Water heaters	Cooking appliances
Photovoltaic panels	Power transformers
Vacuum cleaners	Imaging equipment
Water pumps	Circulators
Air conditioners inc. A-A HPs	Solid fuel boilers
Solid fuel local space heaters	Ventilation units
Air heating / cooling products	Servers and data storage products
Computers	

► ESPR WP

Electronic displays
Low Temperature Emitters
Light sources and separate control gear
Welding equipment
Electric motors and variable speed drives
Household dishwashers
Household washing machines and washer-dryers
Refrigerating appliances (household)
Refrigerating appliances with sales function
EV charging boxes
Professional laundry
Professional dishwashers

Weblink: [Ecodesign for Sustainable Products Regulation - European Commission](#)

EDELWP 22-24 actions in ESPR transitional regime and associated energy labels						
Product group	Type of measure		Reference	Deadline for evaluation, review or rescaling	ESPR transitional regime	Status
	ED	EL				
External power supplies	X		Regulation (EU) 2019/1782	2022-11-14	Transitional regime	Committee vote 13/2/2025
Water pumps	X		Regulation (EU) 547/2012	2016-07-15	Transitional regime	Committee vote 2025: Have-Your-Say portal
Space and combination heaters	X		Regulation (EU) 813/2013 Council Directive 92/42/EEC	2018-09-26	Transitional regime	Act in preparation: Have-Your-Say portal
		X	Regulation (EU) 811/2013	2018-09-16 2025-08-02		Act in preparation: Have-Your-Say portal
Water heaters/storage tanks + solar devices	X		Regulation (EU) 814/2013	2018-09-26	Transitional regime	Act in preparation: Have-Your-Say portal
		X	Regulation (EU) 812/2013	2018-09-26 2025-08-02		Act in preparation: Have-Your-Say portal
Photovoltaic modules, inverters and systems	X	X	New product		Transitional regime	Act in preparation: Have your say portal
Solid fuel local space heaters	X		Regulation (EU) 2015/1185	2024-01-01	Transitional regime	IA in preparation Have your say portal
Air conditioners (incl. air to air heat pumps). Label merged with local space heaters	X		Regulation (EU) 206/2012	2017-03-30	Transitional regime	IA in preparation Have-Your-Say portal
		X	Regulation (EU) 626/2011	2016-07-26 2023-08-02		IA in preparation Have-Your-Say portal
		X	Regulation (EU) 2015/1186	2023-08-02		IA in preparation: Have your say portal
Solid fuel boilers	X		Regulation (EU) 2015/1189	2022-01-01	Transitional regime	IA in preparation Have your say portal
			Regulation (EU) 2015/1187	2022-01-01		IA in preparation Have your say portal
Air heating/cooling products	X		Regulation (EU) 2016/2281	2022-01-01	Transitional regime	IA in preparation Have your say portal



EU Eco-design

ESPR regulation (EU) 2024/1781 - Digital Product Passport (DPP)

A Digital Product Passport (DPP) shall be established under Article 10 of Regulation (EU) 2024/1781 to improve the availability of information relevant to the sustainability of products, thereby enabling informed decisions by consumers, businesses and authorities, and improving traceability along the value chain.

Will be mandatory for products used in the EU:

- **Product-specific requirements** will be laid down in delegated acts.
- The initial focus will be on **batteries, electronics and textiles**.
- DPP information must be provided in an **open, standardized and interoperable format**.
- The DPP may apply at the **model, batch, or individual product level**, depending on the product group.
- Access to DPP information will follow the “**need-to-know**” **principle**, as specified in delegated acts.
- The **economic operator placing the product on the market** is responsible for the DPP and ensuring accurate information.
- The DPP may include **unique operator and facility identifiers** to support traceability across the supply chain.

The DPP should include (where applicable):

- Unique product identifier, compliance documentation, information on substances of concern, user manuals, safety instructions and guidance on product disposal.

The DPP must be **kept up to date**, including any **change of ownership**, as the product moves through the supply chain and is sold to end users.



EU Eco-design

Commission Recommendation (EU) 2022/2510

European assessment framework for 'safe and sustainable by design' chemicals and materials - Safe and Sustainable by Design (SSbD)

Voluntary framework to guide innovation in chemicals and materials towards increased **safety and sustainability**. Developed under the **EU Chemicals Strategy for Sustainability (CSS)**.

Integrates **hazard and risk assessments** with **life cycle assessment**.

- Focuses on full **life cycle impact** of chemicals/materials from early stages of development.
- Composed of a (re-)design phase and an assessment phase

Aims to:

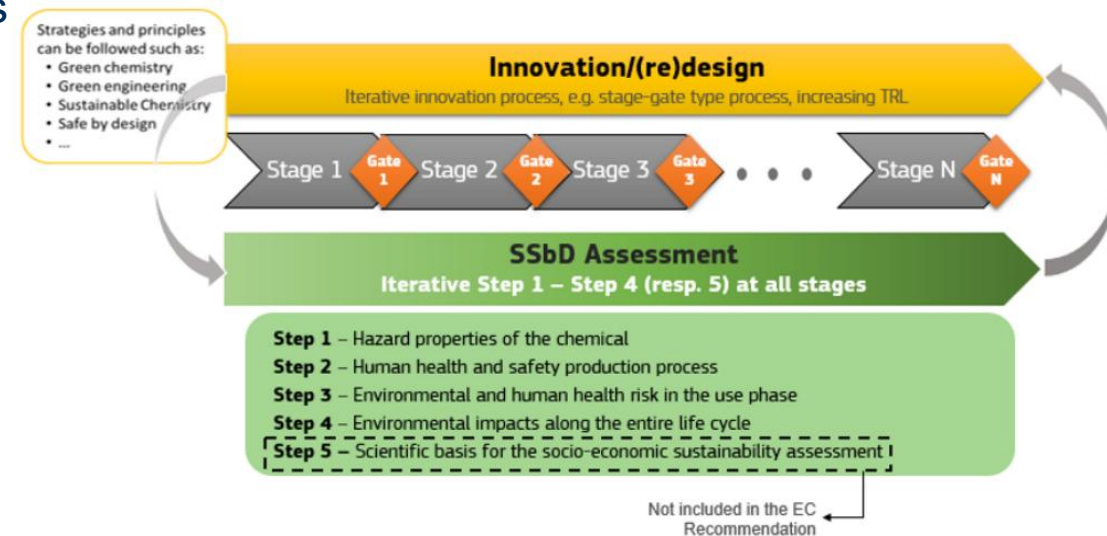
- **Prevent pollution**
- **Identify safer and more sustainable alternatives**
- **Reduce environmental footprint**

Encourages **iterative, data-driven development**.

Tiered approach for LCA, based on data availability.

Comparative assessment: **scoring** system in comparison with a benchmark .

Broader scope and more in-depth compared to eco-design: production processes, use phase, ...





EU Eco-design

Commission Recommendation (EU) 2022/2510 (revision December 2025)

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Aims to:

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Encourages **iterative, data-driven development**.

Tiered approach for LCA, based on data availability.

Comparative assessment: **scoring** system in comparison

Broader scope and **more in-depth** compared to eco-design

Revised framework 2025

New structure of the contents of the safety and sustainable assessment part:

- Step 1,2,3 of the 2022 framework are merged into one safety part
- Process-related risk throughout the supply chain part (alternative production pathways)
- Life cycle assessment adapted in case of low TRLs together with benchmarks to facilitate application
- Approach for implementation evaluation (fx. trade-offs)
- Documentation guidelines (systemic and transparent)

Sourcing and traceability



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EU Conflict Minerals Regulation

Regulation (EU) 2017/821

supply chain due diligence obligations for Union importers of tin, tantalum and tungsten, their ores, and gold originating from conflict-affected and high-risk areas (CAHRAs)

Intended to prevent the import and use of conflict minerals that may finance armed groups or contribute to human rights abuses. Instead, sourcing specific minerals responsibly and transparently. Enforced 2021

- Applies to tin, tantalum, tungsten, and gold (3TG)
- Including: ores, concentrates, or processed metals, imported into the EU from CAHRAs.

Companies' obligations Under the Regulation:

- Management Systems
- Risk Assessment and Management
- Third-Party Audits
- Disclosure and Reporting
- Documentation and Compliance

Non-compliance can result in legal orders or fines.

Companies using finished products or working with recycled metals are not subject to requirements but are encouraged to follow the framework.



Critical Raw Materials Act (CRMA)

Regulation (EU) 2024/1252

establishing a framework for ensuring a secure and sustainable supply of critical raw materials and amending...

Critical Raw Materials are defined by:

- High economic importance
- High supply risk

A material is classified as "critical" if it exceeds thresholds for economic importance and supply. EU lists 34 critical raw materials (2023).

Strategic Raw Materials are characterised by:

- High projected demand growth
- Significant challenges in scaling up production
- Lower economically extractable geological resources compared to current production

EU lists 16 strategic raw materials

Large companies in strategic sectors (*e.g. batteries, renewable energy, aerospace, defence and digital*) using CRMs should:

- Map their supply chains
- Conduct risk assessments of their supply chains at least every three years
- Identify and analyse vulnerabilities and potential risks in the event of supply disruption
- Develop and implement risk mitigation strategies (e.g. diversification)

ISO standards on Sustainable Procurement and Traceability

ISO 20400:2017

Sustainable Procurement - Guidance

provides guidance to organizations, independent of their activity or size, on integrating sustainability within procurement, as described in ISO 26000. It is intended for stakeholders involved in, or impacted by, procurement decisions and processes.

Integrates environmental, social, and economic considerations into procurement.

Focuses on:

- Life-cycle thinking in procurement
- Supplier risk assessment (social/environmental)
- Stakeholder engagement
- Due diligence and transparency in the supply chain
- Building long-term supplier relationships

ISO standards on Sustainable Procurement and Traceability

ISO 22095:2020

Chain of custody – General terminology and models

This document defines a framework for chain of custody by providing:

- a consistent generic approach to the design, implementation and management of chains of custody;
- harmonized terminology;
- general requirements for different chain of custody models;
- general guidance on the application of the defined chain of custody models, including initial guidance on the circumstances under which each chain of custody model might be appropriate.

Standardizes chain of custody models to ensure traceable, credible supply chains.

Four chain of custody models

- Identity Preserved
- Segregated
- Mass Balance
- Book and Claim
- Provides a neutral, credible and verifiable framework applicable across sectors.

Material declaration standards

International standards on Material Declaration

IEC 62474:2018

Material declaration for products of and for the electrotechnical industry

IEC 62474:2018 specifies the procedure, content, and form relating to material declarations for products of companies operating in and supplying the electrotechnical industry. Process chemicals and emissions during product use are not in the scope of this International Standard. It provides data to downstream manufacturers that:

- allows them to assess products against substance restriction compliance requirements;
- they can use in their environmentally conscious design process and across all product life cycle phases. A database associated with this document is available at <http://std.iec.ch/iec62474>. It contains the list of:
 - Declarable substance groups and declarable substances;
 - Reference Substances;
 - Material classes;
 - XML schema for data format and exchange and the accompanying developer table.

International standards on Material Declaration

IEC/ISO 82474-1:2025

Material declaration – Part 1: General requirements

IEC/ISO 82474-1:2025 specifies the requirements and guidance for the content, format and exchange relating to material declarations for products. It is an updated and extended version of IEC 62474, jointly published by IEC and ISO. It specifies the requirements and guidance for the content, format and exchange relating to material declarations for products.

The main intended use of this document is to provide data up and down the supply chain that allows organizations:

- To assess products against material and substance requirements
- To assess process chemical substances used in manufacturing and other stages of the product life
- To use this information in their activities related to environmentally conscious design process and across all product life cycle stages
- To obtain information about material efficiency and circularity of their products

International standards on Material Declaration

IPC-1752A & IPC-1752B

Materials Declaration Management Standard

- Material composition from package to PBA
- Materials and Supplier Declarations committee
- IPC-1752 enables companies in the supply chain to share information on materials in products. There are two supported versions: **IPC-1752A** and **IPC-1752B**.

IPC-1752A With Amendments 1,2, and 3 *Materials Declaration Management Standard*

- establishes a standard reporting format for material declaration data exchange between supply chain participants and supports reporting of bulk materials, components, printed boards, sub-assemblies, and products.

IPC-1752B *Materials Declaration Management Standard*

- From 5 January 2021, all companies in Europe must submit information to ECHA's substances of concern in products (SCIP) database for products they supply which include articles containing REACH candidate list substances above 0.1%. The requirement stems from the revised Waste Framework Directive. To help companies collect the necessary SCIP information from their supply chains, on 1 July 2020 IPC published the new IPC-1752B supply chain data exchange standard.

Waste-related regulations and standards



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Waste-related

Waste Framework Directive (2008/98/EC)

sets out what waste is and how it should be managed

- five-step waste hierarchy
- 'polluter-pays principle'
- extended producer responsibility (EPR)
- LoW-codes (classification of waste)
- R-codes and D-codes to categorise waste treatment operations

Amendment Directive in 2018

Targeted revision of the WFD in 2025 for food and textile waste specifically

LoW-codes:

- Commission Decision 2000/532/EC (11) establishes the European List of Waste (LoW) → latest amendment 12/9/2023, does not require transposition (=decision)
- absolute hazardous, absolute non-hazardous, mirror
- classified by 6-digit number → 20 chapters

R/D-codes (Annex I and II of the WFD)

- 15 Disposal codes (e.g. landfill, incineration without E recovery)
- 13 Recovery codes (e.g., recycling, regeneration)



		Official Journal		
		No	page	date
► <u>M1</u>	Commission Decision 2001/118/EC of 16 January 2001	L 47	1	16.2.2001
► <u>M2</u>	Commission Decision 2001/119/EC of 22 January 2001	L 47	32	16.2.2001
► <u>M3</u>	Council Decision 2001/573/EC of 23 July 2001	L 203	18	28.7.2001
► <u>M4</u>	Commission Decision 2014/955/EU of 18 December 2014	L 370	44	30.12.2014
► <u>M5</u>	Commission Delegated Decision (EU) 2023/2581 of 12 September 2023	L 2581	1	16.11.2023



Waste-related

Packaging and Packaging Waste Regulation (2025/40) amends Directive 94/62/EC

The PPWR will begin to apply from mid-2026. It replaces the existing Packaging Waste Directive. The PPWR regulates what kind of packaging can be placed on the EU market, as well as packaging waste management and prevention measures.

Objectives

- Create business opportunities
- Cut greenhouse gas and fossil fuels
- Harmonise packaging standards across the EU
- Decrease pollution
- Reduce expensive waste
- Make packaging safe again (without deadly “forever” chemicals)

Examples of key provisions and targets

- Reuse targets for packaging in specific sectors, e.g., for transport packaging, by 2030 40% must be reusable within a re-use system (Article 29).
- From 2030 all packaging placed on the market should be designed for material recycling (Article 6).
- Recyclability performance grades (Article 6) and labeling requirements (Article 12). E.g. from 2030 onwards packaging below grade C should be considered to be technically non-recyclable and the placing on the market of such packaging should be restricted.
- Limiting empty space in transport or e-commerce packaging to 50% (Article 24).
- By 1 January or 3 years from the date of entry into force minimum recycled content targets for plastic packaging will apply (e.g., some categories range from 10 % to 35 % recycled content by 2030, increasing by 2040) (Article 7).



Waste-related

WEEE Directive 2012/19/EU

on waste electrical and electronic equipment - WEEE directive

WEEE (Waste Electrical and Electronic Equipment) Directive governs the **collection, treatment, recovery, and environmentally sound disposal** of electrical and electronic equipment at the end of its life. This is a **minimum harmonisation directive**, meaning Member States may impose stricter measures beyond the EU baseline.

- Applies to producers of electrical and electronic equipment (EEE) placed on the EU market
- Aims to reduce the environmental impact of EEE waste and promote resource efficiency
- Sets collection, recovery and recycling targets for different categories of EEE
- Encourages design for dismantling, reuse, and recycling to improve the treatment of WEEE
- Requires producers to finance and organise the take-back and proper treatment of end-of-life EEE

Objectives:

- Prevent e-waste
- Contribute to the efficient use of resources and the retrieval of secondary raw materials through reuse, recycling, and recovery
- Improve the environmental performance of all actors involved in the life cycle of EEE

Various environmental regulations and standards



vito

mec

THOMAS
MORE



Various

RoHS directive 2011/65/EU & 2015/863

on the restriction of the use of certain hazardous substances in electrical and electronic equipment (recast) - Restriction of Hazardous Substances (RoHS) Directive

- Scope: electrical and electronic equipment (EEE). It restricts the use of certain hazardous substances in these products.
- Its purpose is to minimize environmental and health risks from electronic waste by limiting hazardous substances in EEE.
- Restricts the concentration of 10 specific substances (including lead, mercury, cadmium, hexavalent chromium, PBB, PBDE, and certain phthalates) in EEE.
- Directive 2015/863, commonly referred to as RoHS 3, adds four phthalates to the list of restricted substances under RoHS 2 (Directive 2011/65/EU).
 - Lead (Pb)
 - Mercury (Hg)
 - Cadmium (Cd)
 - Hexavalent chromium (Cr⁶⁺)
 - Polybrominated biphenyls (PBB)
 - Polybrominated diphenyl ethers (PBDE)
 - Bis(2-ethylhexyl) phthalate (DEHP)
 - Butyl benzyl phthalate (BBP)
 - Dibutyl phthalate (DBP)
 - Diisobutyl phthalate (DIBP)



Various

REACH Regulation (EC) No 1907/2006

concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending...

is the main EU regulation governing chemicals.

- Its purpose is to protect human health and the environment from risks posed by chemicals through better and earlier identification the properties of chemical substances and by taking measures such as out phasing or restriction.
- Applies to chemical substances manufactured or imported into the EU, including substances in mixtures, articles (e.g. electronics), and raw materials.
- Covers the entire supply chain, including manufacturers, importers, and downstream users.
- Requires companies to identify and manage risks linked to the substances they place on the market. REACH stipulates that chemical substances that exceed 1 tonne per year per company must be registered with ECHA.
- Substances of very high concern (SVHCs) may require authorisation, and some may be restricted or banned.



Various

POPs Regulation (EU) 2019/1021

Regulation on **Persistent Organic Pollutants**. Compliments the Stockholm Convention on POPs, an international treaty addressing POPs globally (2001). Recently amended by the Commission Delegated Regulation (EU) 2025/1930 of 15 May 2025 (adding Dechlorane Plus).

What are POPs?

- Organic chemical substances that resist degradation and remain in the environment for many years.
- They accumulate in living organisms (bioaccumulation) and increase in concentration through the food chain (biomagnification).
- They can be transported long distances (via air, water, migratory species) and contaminate regions far from their source.
- Due to their persistence and ability to accumulate, POPs pose risks to human health and ecosystems

EU Regulation

- Prohibits or restricts production, placing on the market and use of POPs and ensures their monitoring and safe disposal
- A set of annexes listing substances subject to elimination (Annex I), restriction (Annex II), release-reduction obligations (Annex III) and waste-management provisions (Annex IV & V).
- Recent amendments to the EU POPs Regulation (primarily in 2025) have added Dechlorane Plus, Methoxychlor, and UV-328 to the list of restricted substances, lowered the concentration limits for PFOA and PFHxS as unintentional trace contaminants, and updated waste management provisions.

Various

IPC standards related to sustainability

Global Electronics Association (GEA), formerly known as IPC.

GEA's "Evolve" program focusses on advocacy and knowledge distribution.

- Electronic Product Data Description committee
 - IPC-2591** – Connected Factory Exchange (CFX) ⇒ Enables **real-time digital traceability** in smart factories
 - IPC-2553** – Global standard for digital sustainability credentials ⇒ Discontinued
- Data Collection and Reporting for Sustainability Compliance ⇒ under development
 - IPC-1783**: framework and mechanisms for the collection and reporting of data for sustainability compliance and requirements ⇒ top-level umbrella standard, first draft created
 - IPC-1783-CO2e** defines what needs to be measured, estimated, collected and reported for subsequent CO2 equivalent (CO2e) emissions calculations in the electronics manufacturing supply chain
- Assembly & Joining Committee
 - IPC-1402** – Standard for Greener Cleaners Used in Electronic Manufacturing