PRODUCT CATEGORY RULES (PCR)
DATE 2025-09-15

PLASTICS IN PRIMARY FORMS

PRODUCT CATEGORY CLASSIFICATION: UN CPC 347

PCR 2010:16
VERSION 4.0.1

VALID UNTIL: 2028-07-01

TABLE OF CONTENTS

1 INTRODUCTION

This document constitutes Product Category Rules (PCR) developed in the framework of the International EPD System: a programme for type III environmental declarations[1] according to ISO 14025:2006, ISO 14040:2006, ISO 14044:2006, and product-specific standards such as EN 15804 and ISO 21930 for construction products. Environmental Product Declarations (EPD) are voluntary documents for a company or organisation to present transparent, consistent and verifiable information about the environmental performance of their products (goods or services).

The rules for the overall administration and operation of the programme are the General Programme Instructions (GPI), publicly available on www.environdec.com. A PCR complements the GPI and the normative standards by providing specific rules, requirements and guidelines for developing an EPD for one or more specific product categories (see Figure 1). A PCR should enable different practitioners using the PCR to generate consistent results when assessing products of the same product category.

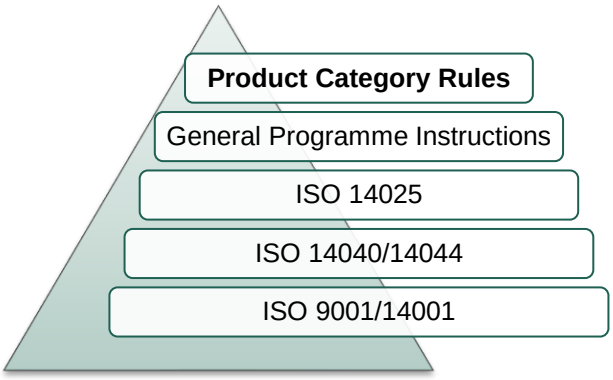

Figure 1 The hierarchy between PCRs, standards and other documents. EN 15804 and ISO 21930 are normative standards for construction products only.

Within the present PCR, the following terminology is adopted:

- The term “shall” is used to indicate what is obligatory, i.e. a requirement.
- The term “should” is used to indicate a recommendation, rather than a requirement. Any deviation from a “should” requirement shall be justified in the PCR development process.
- The terms “may” or “can” is used to indicate an option that is permissible.

For definitions of further terms used in the document, see the normative standards.

A PCR is valid for a pre-determined period of time to ensure that it is updated at regular intervals. The latest version of the PCR is available on www.environdec.com. Stakeholder feedback on PCRs is very much encouraged. Any comments on this PCR may be sent directly to the PCR Moderator and/or the Secretariat during its development or during its period of validity.

Any references to this document shall include the PCR registration number, name and version.

The programme operator maintains the copyright of the document to ensure that it is possible to publish, update, and make it available to all organisations to develop and register EPDs. Stakeholders participating in PCR development should be acknowledged in the final document and on the website.

[1] Type III environmental declarations in the International EPD® System are referred to as EPDs, Environmental Product Declarations.

2 GENERAL INFORMATION

2.1 ADMINISTRATIVE INFORMATION

Name:	Plastics in primary forms
Registration number and version:	2010:16, version 4.0.1
Programme:	The International EPD System
Programme operator:	EPD International AB, Box 210 60, SE-100 31 Stockholm, Sweden. Website: www.environdec.com E-mail: support@environdec.com
PCR Moderators:	Anna Bortoluzzi, anna.bortoluzzi@quotasette.it; Maurizio Fieschi, fieschi@studiofieschi.it
PCR Committee:	Quota Sette S.r.l. Studio Fieschi, Paolo Simon-Ostan, MAPPINGLCA
Date of publication and last revision:	2025-09-15 (version 4.0.1)
Valid until:	2028-07-01 A version history is available in Section 8.
Schedule for renewal:	A PCR is valid for a pre-determined time period to ensure that it is updated at regular intervals. When the PCR is about to expire, the PCR Moderator shall initiate a discussion with the Secretariat how to proceed with updating the PCR and renewing its validity. A PCR may be also be updated without prolonging its period of validity, provided significant and well-justified proposals for changes or amendments are presented. See www.environdec.com for the latest version of the PCR. When there has been an update of the PCR, the new version should be used to develop EPDs. The old version may however be used for 90 days after the publication date of the new version, as long as the old version has not expired.
Standards conformance:	General Programme Instructions of the International EPD System, version 4.0, based on ISO 14025 and ISO 14040/14044
PCR language(s):	At the time of publication, this PCR was available in English If the PCR is available in several languages, these are available at www.environdec.com. In case of translated versions, the English version takes precedence in case of any discrepancies.

2.2 SCOPE OF PCR

2.2.1 PRODUCT CATEGORY DEFINITION AND DESCRIPTION

This document provides Product Category Rules (PCR) for the assessment of the environmental performance of Plastics in primary forms and the declaration of this performance by an EPD. The product category corresponds to UN CPC Group 347 Plastics in primary forms.

The term “Plastic” is to be intended as defined by ISO 472:2013, as a *“material which contains as an essential ingredient a highpolymer and which at some stage of its processing into finished products can be shaped by flow”.*

This PCR document takes into consideration both thermoplastic and thermosetting materials.

The term “thermoplastic” is to be intended as defined by ISO 472:99, as a *“plastic capable of being softened repeatedly by heating and hardened by cooling, through a temperature range characteristic of the plastic and, in the softened state, of being shaped by flow repeatedly into articles by moulding, extrusion or forming”* – see also the definition of ASTM D883-2017

The term “thermosetting” is to be intended as defined by ISO 472:2013, as a *“plastic capable of being changed into a substantially infusible and insoluble product when cured by heat or by other means such as radiation, catalysts, etc*.” – see also the definition of ASTM D883-2017.

More specifically, the UN CPC group and the associated classes covered by this PCR are:

- Division 34 Basic chemicals
  - Group 347 Plastics in primary forms
    - Class 3471 Polymers of ethylene, in primary forms
    - Class 3472 Polymers of styrene, in primary forms
    - Class 3473 Polymers of vinyl chloride or other halogenated olefins, in primary forms
    - Class 3474 Polyacetals, other polyethers and epoxide resins, in primary forms; polycarbonates, alkyd resins, polyallyl esters and other polyesters, in primary forms
    - Class 3479 Other plastics in primary forms; ion exchangers

It is assumed that all polymers not explicitly included in the individual CPC classes 3471-3474 are included in the CPC class 3479. For more details about the products covered by this PCR document, see the *HS[2] 2017* and *CPV[3] 2007* classifications reported in Annex A.

Primary forms are intended as before any conversion process (i.e., extrusion, injection moulding, etc), ready to be sold to external parties. Typical primary forms are for granules, chips, pellets, powder, gel, or analogous forms.

For clarification, the following product categories are included within the scope:

- Plastics from renewable resources
- Recycled plastics
- Compounds from thermoplastics polymers
- Thermoplastic elastomers (TPE) as defined by ISO 472:2013

NOTE – Elastomeric materials, which also are shaped by flow, are not considered as plastics, are covered by UN CPC 348, and are excluded from the scope.

The product group and CPC code shall be specified in the EPD.

2.2.2 GEOGRAPHICAL SCOPE

This PCR may be used globally.

2.2.3 EPD VALIDITY

An EPD based on this PCR shall be valid for a 5-year period starting from the date of the verification report (“approval date”), or until the EPD has been de-registered from the International EPD System.

An EPD shall be updated and re-verified during its validity if changes in technology or other circumstances have led to:

- an increase of 10% or more of any of the declared indicators of environmental impact,
- errors in the declared information, or
- significant changes to the declared product information, content declaration, or additional environmental, social or economic information.

If such changes have occurred, but the EPD is not updated, the EPD owner shall contact the Secretariat to de-register the EPD.

3 PCR REVIEW AND BACKGROUND INFORMATION

This PCR was developed in accordance with the PCR development process described in the GPI of the International EPD System, including open consultation and review.

3.1 OPEN CONSULTATION

3.1.1 VERSION 1.0

Version 1.0 was available for open consultation 2010-04-28 until 2010-06-28.

3.1.2 VERSION 2.0

Version 2.0 was available for open consultation 2012-10-24 until 2012-11-23.

3.1.3 VERSION 3.0

Version 3.0 was available for open consultation from 2017-09-18 until 2017-11-18

3.1.4 VERSION 4.0

This PCR was available for open consultation from 2023-06-08 until 2023-08-08, during which any stakeholder was able to provide comments by posting on the PCR forum on www.environdec.com or by contacting the PCR moderator.

Stakeholders were invited via e-mail or other means to take part in the open consultation and were encouraged to forward the invitation to other relevant stakeholders. The following stakeholders provided comments during the open consultation and agreed to be listed as contributors in the PCR and on www.environdec.com.

- Mukunth Natarajan, Jonathan Balsvik, Lauren Johnson and Julie Sinistore, WSP USA Inc.

3.2 PCR REVIEW

3.2.1 VERSION 1.0 AND 2.0

Versions 1.0 and 2.0 was reviewed by the Technical Committee of the International EPD System.

3.2.2 VERSION 3.0

PCR review panel:	The Technical Committee of the International EPD System. A full list of members available on www.environdec.com. The review panel may be contacted via support@environdec.com. Members of the Technical Committee were requested to state any potential conflict of interest with the PCR moderator or PCR committee, and were excused from the review.
Chair of the PCR review:	Paola Borla
Review dates:	2018-05-04 until 2018-06-08

3.2.3 VERSION 4.0.0

PCR review panel:	The Technical Committee of the International EPD System. A full list of members is available on www.environdec.com. The review panel may be contacted via support@environdec.com. Members of the Technical Committee were requested to state any potential conflict of interest with the PCR Committee, and if there were conflicts of interest they were excused from the review.

Chair of the PCR review:	Paola Borla
Review dates:	2023-11-23 until 2024-03-27

3.3 EXISTING PCRS FOR THE PRODUCT CATEGORY

As part of the development of this PCR, existing PCRs and other internationally standardized methods that could potentially act as PCRs were considered to avoid unnecessary overlaps in scope and to ensure harmonisation with established methods of relevance for the product category. The existence of such documents was checked among the following EPD programmes and international standardisation bodies:

- International EPD System. www.environdec.com.
- GlobalEPD
- EPD Norway
- IBU
- PEP ecopassport®
- EarthSure
- EDF
- KEITI Environmental Declaration of Products
- JEMAI EcoLeaf
- JEMAI CFP Program
- UL Environment
- ASTM International EPD Program
- NSF International National Center for Sustainability Standards EPD
- SM Transparency Report Program
- FPInnovations EPD Program on wood building products
- ICC Evaluation Service Environmental Product Declaration Program
- Carbon Leadership Forum PCRs
- BRE Global EN EPD Verification Scheme
- DAPcons®
- SCS Global Services
- AENOR Global EPD (Aenor declaraciones-ambientales-de-producto)

No existing PCRs or other relevant internationally standardized methods with overlapping scope were identified

3.4 REASONING FOR DEVELOPMENT OF PCR

This PCR was developed to enable publication of EPDs for this product category based on ISO 14025, ISO 14040/14044 The PCR enables different practitioners to generate consistent results when assessing the environmental impact of products of the same product category, and thereby it supports comparability of products within a product category.

3.5 UNDERLYING STUDIES USED FOR PCR DEVELOPMENT

The methodological choices made during the development of this PCR (declared/functional unit, system boundary, allocation methods, impact categories, data quality rules, etc.) were primarily based on the following underlying studies:

- Bastioli C (Ed.) (2005) Handbook of biodegradable polymers. Smithers Rapra Publishing.

- PlasticsEurope (2024) Eco-profiles for determining environmental impacts of plastics. https://plasticseurope.org/sustainability/circularity/life-cycle-thinking/eco-profiles-set/, accessed May 2024.

4 GOAL AND SCOPE, LIFE CYCLE INVENTORY AND LIFE CYCLE IMPACT ASSESSMENT

The goal of this section is to provide specific rules, requirements and guidelines for developing an EPD for the product category as defined in Section 2.2.1.

4.1 DECLARED UNIT

The declared unit shall be 1 kg of product in the form of granules, chips, pellets, powder, gel, including its packaging (the weight of the packaging is not included in this 1 kg).

Plastics can be sold in bulk or in different types of packaging such as bags, big-bags and octabins. If the product is sold in different types of packaging, the results shall be assessed considering a weighted mean of the packaging used in the reference period by the company.

The reference flow in the LCA shall be defined at the point where the product leaves the producer gate, i.e. any losses occurring before then shall be taken into account.

This PCR uses a declared unit instead of a functional unit because not all relevant functional aspects are possible to capture in one or a few predefined functional units. All relevant functional aspects (technical specification) shall, however, be taken into consideration when comparing EPDs based on this PCR.

4.2 TECHNICAL SPECIFICATION, LIFESPAN AND REFERENCE SERVICE LIFE (RSL)

RSL and lifespan are not applicable for this product category.

Table 1 lists information on the technical specification of the polymer that shall be reported if relevant.

Table 1 Mandatory product information to declare in the EPD, if relevant.

Technical specification	**Test method**
Density	ISO 1183-2:2019
Melt Flow Rate	ISO 1133-1:2011 ISO 1133-2:2011
Mechanical properties: Tensile	ISO 527-1-2019 ISO 527 2: 2012
Melting temperature (or glass transition temperaturefor amorphous polymers)	ISO 11357-1:2016 ISO 11357-2:2020 ISO 11357-5:2013
Deflection Temperature under load	ISO 75f:2004

Table 2 lists information on characteristic properties of the application field that may be reported.

Table 2 Optional product information to declare in the EPD.

Technical specification	Test method
Mechanical properties: Impact	ISO 179-1: 2010 ISO 179-2-2020
Vicat softening temperature	ISO 306:2013
Thermal conductivity	ISO 22007-1:2017
Volume resistivity	IEC 62631-3-1:2016
Flame behaviour	UL 94 (2013)

NOTE – The values presented in the EPD shall be the typical values of the plastic material under consideration, where for “typical value” it is intended the average value measured over at least 10 production batches, in order to obtain a reliable reference value. If a lower number of lots or a different method is used to determine the typical value this shall be detailed.

NOTE – The mandatory information relative to the material does not have to be reported if the material is not included in th eapplication field of the above-mentioned technical specifications.

NOTE – The voluntary information shall be coherent with the corresponding Technical Data Sheet.

NOTE – Equivalent standard methods, other than those indicated, may be used (e.g. ASTM). The company who develops the EPD can use the latest version of the standards if it verifies that the content is equivalent to the standards listed above.

4.3 SYSTEM BOUNDARY

The scope of this PCR and EPDs based on it is cradle-to-gate.

Plastic in primary form (mainly granules but also chips, pellets, powder, gel) is raw material or an intermediate material (for example compounds) for which further processing may, and often includes, chemical additivation and/or incorporation into many different possible articles for many different market applications.

These materials form the ”building blocks” for a production chain of countless items in very different markets, making their end use and end-of -life treatment often unpredictable: that is the reason why the cradle-to-gate approach was chosen.

The information offered by the EPDs regarding the raw material is not of interest to the consumer; in fact, raw materials and intermediates arrive at the consumer always converted into items and articles with CPC codes (other than those included in this PCR) applicable to the articles, to which end-of-life applies. The EPDs based on this PCR shall, therefore, not be used for business-to-consumer communication.

NOTE – To avoid negative GWP-biogenic results because of the incomplete biogenic carbon balance arising due to the exclusion of the end-of-life stage, the characterisation factors of biogenic CO_2 uptake and emissions shall be set to zero (the “0/0 approach”). This needs to be considered if the EPD is used as input to a downstream EPD, which often will require that uptake and emissions of biogenic CO_2 are accounted for when assessing the GWP-biogenic indicator. i.e., that the characterisation factors of biogenic CO_2 uptake and emissions are set to -1 and +1, respectively (the “-1/+1 approach”).

4.3.1 LIFE-CYCLE STAGES

For the purpose of different data quality rules and for the presentation of results, the life cycle of the product is divided into life cycle stages:

- Upstream processes (from cradle-to-gate)
- Core processes (from gate-to-gate)
- Downstream processes (not applicable in this PCR)

In the EPD, the environmental performance associated with each of the included life-cycle stages above shall be reported separately and in aggregated form. The processes included in the scope of the PCR and belonging to each life cycle stage are described in Sections 4.3.1.1–4.3.1.3.

4.3.1.1. Upstream processes

The following unit processes are part of the product system and shall be classified as upstream processes:

- Extraction of non-renewable resources (e.g. operation of oil platforms and pipelines)
- Growing, harvesting and collecting of renewable resources (e.g. agricultural planting, forest resources, general vegetable scraps, etc)
- Refining, transfer and storage of extracted or harvested resources into feedstock for production (e.g. starches, cellulose)
- Monomers production
- Intermediate raw materials production (e.g. pre-polymers, etc.) – if the EPD is made for a compound, this includes all the stages of base polymer/s production as it represents an upstream process of compounding.
- Additives and activators production processes (e.g. fibre glass, carbon black, titanium dioxide, lubricants, fillers, pigments, etc.)
- Secondary and recycled raw materials production. This includes plastics waste and scraps recovery/recycling processes, collection and selection of post-consumer and post-industrial waste, washing of post-consumer waste, grinding of scraps and/or post-industrial feedstock, mechanical or chemical recycling process (e.g. mechanical and/or chemical treatment, depolymerisation, etc) (Refer to Note below)
- Solvent (used in polymerization) production process (e.g. hexane, methylene chloride, chloroform, sulphuric acid, trichloroethane, methanol, etc.)
- Maintenance products and materials production
- All relevant transportation (transport of raw materials, fuels and products at all stages)
- Treatment of waste and wastewater generated by all upstream processes
- The production processes of energy wares used in the extraction and refinement
- Production of electricity and fuels used in the upstream module
- Manufacturing of primary and secondary packaging
- Production of additives used in auxiliary core processes (e.g. chemicals for water treatment internal plant)

Upstream processes not listed may also be included. All elementary flows at resource extraction shall be included, except for the flows that fall under the general cut-off rule in Section 4.5.

NOTE: According to Section 4.6.2 flows from previous products that follow polluter pays principle are not included in the system boundary.

4.3.1.2. Core processes

The following unit processes are part of the product system and shall be classified as core processes:

- External transportation to the core processes
- Production processes
- Polymer production according to process technology and plastic type:
  - Polymerization (including monomer synthesis if applicable as core process)
  - Separation and purification of organic solvents
  - Recovery and purification of unreacted monomers
  - Separation of polymerization by-products
  - Extrusion and pelletizing of polymer
  - Pellets washing
  - Pellets drying
  - Dry mixing
- Half-processed product transportation
- Compounding:
  - Extrusion and pelletizing
  - Half-processed product transportation

- Plastics waste and scraps recovery/recycling processes[2] if they are carried on by the company publishing the EPD. This includes selection of post-consumer and post-industrial waste, washing of post-consumer waste, grinding of scraps and/or post-industrial feedstock, mechanical or chemical recycling process (e.g. mechanical and/or chemical treatment, depolymerisation, etc.)

- Storage and handling of materials, storage and packaging of final product (see following NOTE).
- End-of-life treatment of manufacturing waste, even if carried out by third parties, including transportation.
- Generation of electricity and production of fuels, steam and other energy carriers used in core processes.

NOTE – All handling and storage operations for the materials/products shall be considered, including mechanical activities (e.g.pneumatic conveying systems) and thermic activities (e.g. storage in controlled temperature of intermediate and final products)

Core processes not listed may also be included. Manufacturing of a minimum of the total weight of the declared product including packaging shall be included, as described in Section 4.5.

The following processes shall not be included:

- business travel of personnel, and
- research and development activities.

4.3.1.3. Downstream processes

Not included for EPDs based on this PCR.

4.3.2 SYSTEM BOUNDARIES FOR INFRASTRUCTURE/CAPITAL GOODS AND EMPLOYEES

Personnel-related processes, such as transportation of employees to and from work, shall not be accounted for.

In general, the production and end-of-life processes of infrastructure or capital goods[3] used in the product system should not be included within the system boundaries. They may be included when infrastructure and capital goods are known to be relevant in terms of their environmental impact, or when a generic LCI dataset includes infrastructure/capital goods, and it is not possible, within reasonable effort, to subtract the data on infrastructure/capital goods from this dataset. If an infrastructure/capital good is produced with the intention to be used one or a few times only (e.g., a manufacturing plant or machinery constructed to produce only one product), this infrastructure/capital good shall be included.

The inclusion or exclusion of infrastructure/capital goods shall be transparently described for upstream, core and downstream processes in the LCA report and in the EPD.

If infrastructure/capital goods are included, the following disclaimer shall be included in the results sections of the LCA report and in the EPD (land use and toxicity indicators shall only be mentioned if declared in the EPD):

The results of the impact categories abiotic depletion of minerals and metals, land use, human toxicity (cancer), human toxicity, non-cancer and ecotoxicity (freshwater) may be highly uncertain in LCAs that include capital goods/infrastructure in generic datasets, in case infrastructure/capital goods contribute greatly to the total results. This is because the LCI data of infrastructure/capital goods used to quantify these indicators in currently available generic datasets sometimes lack temporal, technological and geographical representativeness. Caution should be exercised when using the results of these indicators for decision-making purposes.

[2] In case of production chain, this PCR document can be potentially connected to the PCR Plastic waste and scrap recovery (recycling) services (UN CPC 8942). In the case of compounding processes, involving a raw material from recycling or recovery, "production chains" may occur. A production chain occurs when the EPD owner is responsible for the recycling process in addition to the compounding process. In the case of "production chains", the EPD owner must refer to the PCR Plastic waste and scrap recovery (recycling) services (UN CPC 8942) for modelling the environmental indicators of the raw material from recycling or recovery.

[3] Examples of infrastructure and capital goods are the building in which the studied product or upstream materials or components are produced, machinery used in the manufacturing of the product or its materials or components, or vehicles used in transports in the product system. For example, if the EPD is on wind power, the power plant itself is considered the studied product and not infrastructure/capital goods. However, the buildings and machinery that make the wind turbine components are considered infrastructure/capital goods. Similarly, if the EPD is on a means of transport, the vehicle is considered the studied product and not infrastructure/capital goods.

4.3.3 OTHER BOUNDARY SETTING

4.3.3.1. Boundary towards nature

Boundaries to nature are defined as where the flows of material and energy resources leaves nature and enters the technical system (i.e. the product system). Emissions cross the system boundary to nature when they are emitted to air, soil or water.

4.3.3.2. Boundary towards other technical systems

Boundaries towards other technical systems define the flow of materials and components to/from the product system under study and from/to other product systems. If there is an inflow of recycled material to the product system in the production/manufacturing stage, the transport from the scrapyard/collection site to the recycling plant, the recycling process, and the transportation from the recycling plant to the site where the material is being used shall be included. If there is an outflow of material or component to recycling, the transportation of the material to the scrapyard/collection site shall be included. The material or component going to recycling is then an outflow from the product system.

See Section 4.6 for further guidance.

4.3.3.3. Temporal boundary

The temporal boundary defines the time period for which the life cycle inventory data is recorded, e.g. for how long emissions from waste deposits are accounted. As default, the time period over which inputs to and outputs from the product system is accounted for shall be 100 years from the year that the LCA model best represents, considering the representativeness of the inventory data. This year shall, as far as possible, represent the year of the publication of the EPD.

4.3.3.4. Geographical boundary

The geographical boundary defines the geographical coverage of the LCA. This shall reflect the physical reality of the product under study, accounting for the representativeness of technology, input materials and input energy.

4.4 SYSTEM DIAGRAM

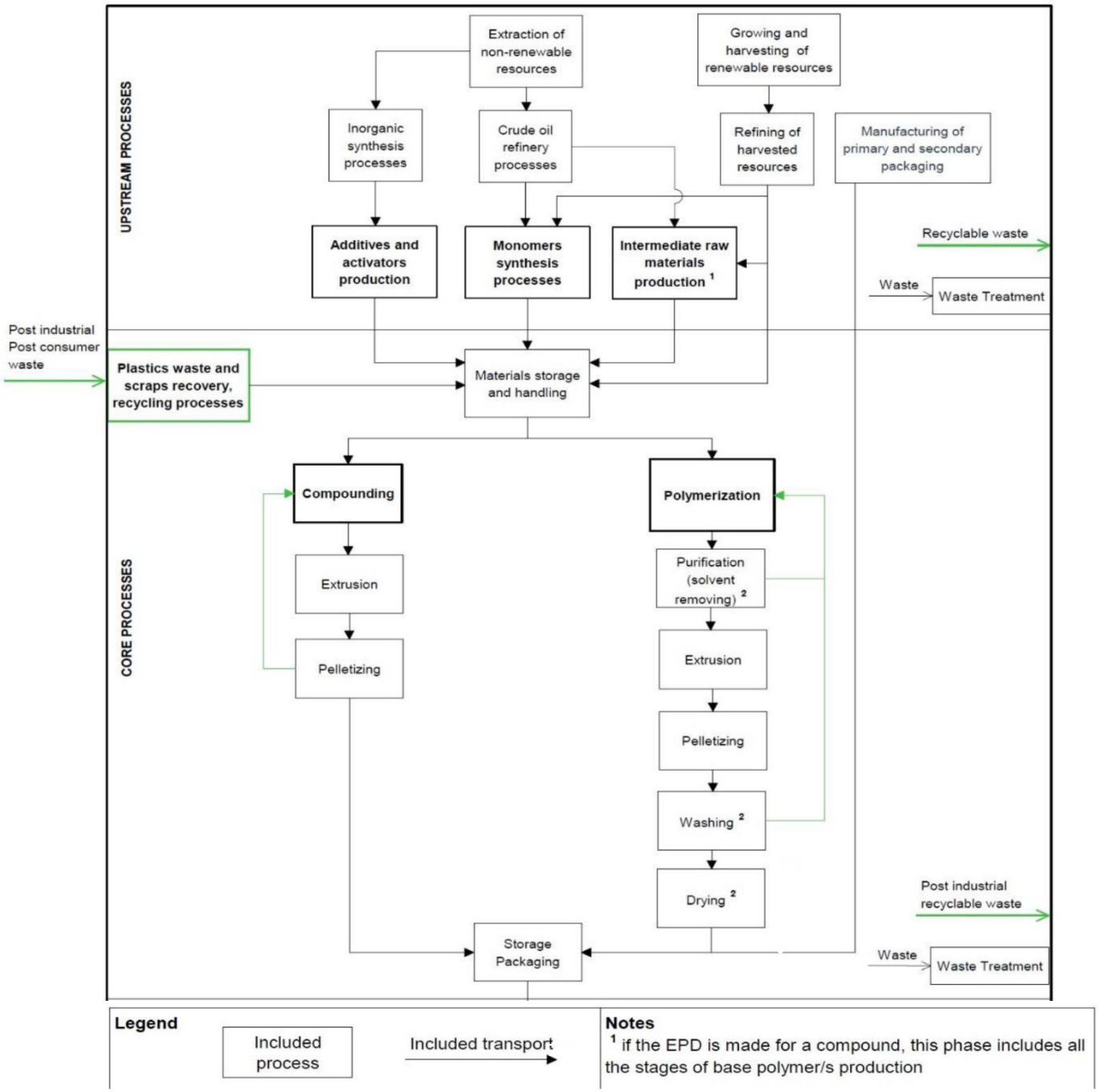

Figure 2 System diagram illustrating the processes that shall be included in the product system, divided into upstream, core and downstream processes. The illustration of processes to include may not be exhaustive.

4.5 CUT-OFF RULES

A cut-off rule of 1% shall be applied. In other words, the included inventory data (not including inventory data of processes that are explicitly outside the system boundary as described in Section 4.3) shall together give rise to at least 99% of the results of any of the environmental impact categories. Also, 99% of the mass of the product content and 99% of the energy use of the product life cycle shall be accounted for. The cut-off of inventory data should, however, be avoided, and all available inventory data shall be used.

The cut-off of inventory data, based on the above cut-off rule, should be an output of a sensitivity analysis, alone or in combination with expert judgment based on experience of similar product systems. Furthermore, the cut-off shall be possible to be verify in the verification process, hence the exclusion of inventory data based on the cut-off rule shall be documented in the LCA report, and the EPD developer shall provide the information the verifier considers necessary to verify the cut-off.

4.6 ALLOCATION RULES

Allocation can be divided into allocation of co-products, i.e. allocation of unit processes that generate several products, and allocation of waste, i.e. allocation of unit processes that generate materials that are, for example, landfilled recovered, recycled or reused, and which require further processing to cease being waste and become products (see criteria for end-of-waste state in Section 4.6.2).

The principles for allocation of co-products and allocation of waste are described separately in the following subsections.

4.6.1 CO-PRODUCT ALLOCATION

The following hierarchy of allocation methods shall be followed for co-product allocation:

1. Allocation shall be avoided, if possible, by dividing the process to be allocated into sub-processes and collecting the inventory data for each sub-process.
2. If allocation cannot be avoided, the inventory data should be partitioned between the different co-products in a way that reflects the underlying physical relationships between them, i.e. allocation should reflect the way in which the inventory data changes if the quantities of delivered co-products change.
3. If a physical relationship between the inventory data and the delivery of co-products cannot be established, the inventory data should be allocated between the co-products in a way that reflects other relationships between them. For example, inventory data might be allocated between co-products in proportion to their economic values. If economic allocation is used, a sensitivity analysis exploring the influence of the choice of the economic value shall be included in the LCA report.

If allocation is made to co-product flows leaving the system, then the allocation procedure shall be identical to the allocation procedure used for such co-products flows entering the system.

For identification of co-products, differences between co-products and waste, and allocation rules, see Section A.5 of the GPI.

For key processes in the product system, Table 3 provides specific allocation guidance.

Table 3 Allocation method for key processes in the product system.

PROCESS	MAIN PRODUCT AND CO-PRODUCTS	ALLOCATION METHOD
Polymer production/ extrusion	Reference main product: polymer Co-Product: intermediate or discarded material	Economic allocation, based on the ratio between the weighted average price of the main product (or group of similar products) and the weighted average price of the intermediate or discarded material
Compounding	Reference main product: compound Co-Product: intermediate or discarded material	Economic allocation, based on the ratio between the weighted average price of the main product (or group of similar products) and the weighted average price of the intermediate or discarded material

4.6.2 ALLOCATION OF WASTE TREATMENT PROCESSES

Allocation of waste shall follow the polluter pays principle and its interpretation in EN 15804: “processes of waste processing shall be assigned to the product system that generates the waste until the end-of-waste state is reached.” The end-of-waste state is reached when all the following criteria for the end-of-waste state are fulfilled (adapted from EN 15804):

- the recovered material, component or product is commonly used for specific purposes;
- a market or demand, identified e.g. by a positive economic value, exists for such a recovered material, component or product;
- the recovered material, component or product fulfils the technical requirements for the specific purposes and meets the existing legislation and standards applicable to products; and
- the use of the recovered material, product or construction element will not lead to overall adverse environmental or human health impacts.

The above outlined principle means that the generator of the waste shall carry the full environmental impact until the point in the product life cycle in which the end-of-waste criteria are fulfilled. For plastic materials, the ECHA “Guidance on waste and recovered substance” can support the technical definition of “end-of-waste” status (ECHA 2010). Waste may have a negative economic market value, and then the end-of-waste stage is typically reached after (part of) the waste processing and further refinement, at the point at which the waste no longer has a negative market value. This allocation method is (in most cases) in line with a waste generator’s juridical and financial responsibilities. See the GPI for further information and examples.

4.7 DATA QUALITY REQUIREMENTS AND SELECTION OF DATA

Life cycle inventory data are classified into specific data and generic data, where the latter can be selected generic data or proxy data. The data categories are defined as follows:

- specific data (also referred to as “primary data” or “site-specific data”):
  - data gathered from the actual manufacturing plant where product-specific processes are carried out;
  - actual data from other parts of the life cycle traced to the product under study, for example site-specific data on the production of materials or generation of electricity provided by contracted suppliers, and transportation data on distances, means of transportation, load factor, fuel consumption, etc., of contracted transportation providers; and
  - LCI data from databases on transportation and energyware that is combined with actual transportation and energy parameters as listed above.
- generic data (sometimes referred to as “secondary data”), divided into:
  - selected generic data: data (e.g. commercial databases and free databases) that fulfil prescribed data quality requirements for precision, completeness, and representativeness (see below Section 4.7.1),
  - proxy data: data (e.g. commercial databases and free databases) that do not fulfil all of the data quality requirements of “selected generic data”.

Specific data shall be used for the core processes. Specific data shall be used for upstream and downstream processes, when available, otherwise generic data may be used. Generic data should be used in cases in which they are representative for the purpose of the EPD, e.g. for bulk and raw materials on a spot market, if there is a lack of specific data on the final product or if a product consists of many components.

Mass balance approaches (MBAs) are sometimes used in LCA contexts to claim biobased, renewable, and/or recycled product content. MBAs are based on organizations (e.g. integrated chemical production systems) and not on single product systems, and they apply calculations and mass balance criteria that are not based on the physical relationship between input resources and product content. This implies that if biobased, renewable or recycled raw materials are not physically present in the product, the content of the product may be accounted as being biobased, renewable or recycled. Because of this, the current position of the International EPD System is that MBAs do not follow the ISO 14040 series and related standards and shall not be used in EPDs. If MBAs are further developed, exemptions may be done in updated version of this PCRs.

4.7.1 RULES FOR USING GENERIC DATA

For generic data to be classified as “selected generic data”, the following requirements apply

- datasets shall be based on attributional LCA modelling (e.g., not be based on marginal data and not include credits from system expansion),
- the reference year shall be as current as possible and should be representative for the validity period of the EPD,
- the cut-off rule (as described in Section A.3.3) shall be met on the level of the product system,
- datasets shall represent average values for a specific reference year; however, how data are generated could vary, e.g. over time, and then they should have the form of a representative annual average value for a specified reference period (such deviations shall be justified and declared in the EPD), and

- the representativeness of the data shall be assessed to be better than ±5%, in terms of the environmental impact calculated on the basis of the data, of data that is fully representative for the given temporal, technological and geographical context.

If selected generic data that meets the above data quality requirements are not available, proxy data may be used. The environmental impacts associated with proxy data shall not exceed 10% of the overall environmental impact of the product system.

The EPD may include a data quality declaration to demonstrate the share of specific data, selected generic data and proxy data contributing to the results of the environmental impact indicators.

4.7.2 EXAMPLES OF DATABASES FOR GENERIC DATA

Table 4 lists examples of databases and datasets to be used for generic data. Please note that a data quality assessment shall be performed also for data listed in the table, and that other data that fulfil the data quality requirements may also be used.

Table 4 Examples of databases and datasets to use for generic data.

PROCESS	GEOGRAPHICAL SCOPE	DATASET	DATABASE
Polymer production	EUROPE	Polymers	Industry data 2.0 (Plastics Europe Ecoprofiles)
Polymer production	Rest of the world	Polymers	Ecoinvent
Polymer production	World	Polymers	CarbonMinds

4.7.3 DATA QUALITY REQUIREMENTS AND OTHER MODELLING GUIDANCE PER LIFE-CYCLE STAGE

Below are further data quality requirement per life-cycle stage. Exceptions to the requirements may be accepted, if justified in the EPD; such exceptions are subject to the approval by the verifier on a case-to-case basis.

4.7.3.1. Upstream processes

- Data referring to processes and activities upstream in a supply chain over which the EPD owner has direct management control shall be specific and collected on site. Specific data shall be used for the following upstream processes, if they are carried out within the company who develops the EPD:
  - Monomers production
  - Intermediate raw materials production (e.g. pre-polymers, etc.) – if the EPD is made for a compound, this phase includes all the stages of base polymer/s production as it represents an upstream process of compounding.

  The requirement for specific data also includes actual product weights, amounts of raw materials used and amounts of waste etc.
- Data referring to contractors that supply main parts, packaging, or main auxiliaries should be requested from the contractor as specific data, as well as infrastructure, where relevant.
- Data on transport of main parts and components along the supply chain to a distribution point (e.g. a stockroom or warehouse) where the final delivery to the manufacturer can take place, should be specific and based on the actual transportation mode, distance from the supplier, and vehicle load.
- In case specific data is lacking, selected generic data may be used. If this is also lacking, proxy data may be used (see Section 4.7).
- For upstream processes modelled with specific data, generation of electricity used shall be accounted for in this priority:
  1. Specific electricity mix as generated, or purchased from an electricity supplier, demonstrated by a Guarantee of Origin or similar as provided by the electricity supplier.
  2. Residual electricity mix of the electricity supplier on the market.
  3. Residual electricity mix on the market[4].

[4] The composition of the residual grid mixes on the market are available for all EU countries and a few additional European countries through the Association for Issuing Bodies (AIB) at https://www.aib-net.org/facts/european-residual-mix.

4. Electricity consumption mix on the market[5].

The residual electricity mix is the mix when all contract-specific electricity that has been sold to other customers has been subtracted from the total consumption mix.

"The market" in the above hierarchy shall be defined as being the (residual or consumption) grid mix of the country where the electricity is used, with exceptions for specified countries for which a sub-national electricity grid mix shall be used: Australia, Brazil, Canada, China, India, and USA.

The mix of electricity used in upstream processes shall be documented in the EPD, where relevant.

- Packaging: specific data of the average distribution packaging shall be used. The average distribution packaging has to be modeled as the weighted mean of the different packaging solutions used for delivery in the reference year by the company.

4.7.3.2. Core processes

The following requirements apply to the core processes:

- Specific data shall be used for the assembly of the product and for the manufacture of main parts as well as for on-site generation of steam, heat, electricity, etc., where relevant.
- However, selected generic data (see note below) may be used for the following core processes if they are carried out outside the company who develops the EPD and the suppliers do not accept to share specific data with the customer:
  - Plastics waste and scraps recovery/recycling processes (for more details see §3.2.2)
- Transport from the delivery point of raw materials, chemicals, main parts, and components (see above regarding upstream processes) to the manufacturing plant/place of service provision should be based on the actual transportation mode, distance from the supplier, and vehicle load, if available.
- For electricity used in the core processes, generation of electricity used shall be accounted for in this priority:
  1. Specific electricity mix as generated, or purchased from an electricity supplier, demonstrated by a Guarantee of Origin or similar as provided by the electricity supplier.
  2. Residual electricity mix of the electricity supplier on the market.
  3. Residual electricity mix on the market[6].
  4. Electricity consumption mix on the market[7]. This option shall not be used for electricity used in processes over which the manufacturer (EPD owner) has direct control, as long as the composition of the residual grid mix has been publicly disclosed[8].

  The residual electricity mix is the mix when all contract-specific electricity that has been sold to other customers has been subtracted from the total consumption mix.

  "The market" in the above hierarchy shall be defined as being the (residual or consumption) grid mix of the country where the electricity is used, with exceptions for specified countries for which a sub-national electricity grid mix shall be used: Australia, Brazil, Canada, China, India, and USA.

  The mix of electricity used in the core processes shall be documented in the EPD, where relevant.
- Waste treatment processes of manufacturing waste should be based on specific data, if available.

4.7.3.3. Downstream processes

As stated in Section 4.3, the scope of this PCR and EPDs based on it is cradle-to-gate and therefore downstream processes shall not be included.

---

[5] For electricity markets without trade of Guarantees of Origin (or similar), the residual mix will, however, be identical to the consumption mix.

[6] The composition of the residual grid mixes on the market are available for all EU countries and a few additional European countries through the Association for Issuing Bodies (AIB) at https://www.aib-net.org/facts/european-residual-mix.

[7] For electricity markets without trade of Guarantees of Origin (or similar), the residual mix will, however, be identical to the consumption mix.

[8] If the composition of the residual grid mix has not been publicly disclosed, the second or third options in the above hierarchy are not feasible and thus the fourth option is the only remaining option (if the first option is not chosen).

4.7.4 DATA QUALITY DECLARATION

EPDs may include a declaration of the quality of data used in the LCA calculations.

4.8 ENVIRONMENTAL PERFORMANCE INDICATORS

The EPD shall declare the default environmental performance indicators and their methods as described at the website (www.environdec.com), which includes both inventory indicators and indicators of potential environmental impact. The source and version of the impact assessment methods and characterisations factors used shall be reported in the EPD. Also other indicators may be declared, if justified, see Section 5.4.5.

An adjustment of the default impact assessment method and characterisation factor is done for the GWP-biogenic indicators, as characterisation factors for uptake and emissions of biogenic CO_2 shall be set to zero to avoid negative GWP-biogenic results due to an incomplete biogenic carbon balance. Read more in Section 4.3.

If the default list of environmental performance indicators and methods at the www.environdec.com/indicators is updated, the previous version of the list is valid in parallel to the new version during a transition period of at least 90 days, as described at the website.

Apart from inventory indicators (such as the required and optional inventory indicators listed at www.environdec.com/indicators), other inventory data may also be declared in the EPD, if relevant and useful for EPD users. Such data shall not be declared in the main body of the EPD, but in an annex.

4.9 INCLUDING MULTIPLE PRODUCTS IN THE SAME EPD

4.9.1 MULTIPLE PRODUCTS FROM THE SAME COMPANY

Several sets of results, reflecting different products, are not allowed to be declared in the same EPD. However, similar products from a single or several manufacturing sites covered by the same PCR and manufactured by the same company with the same major steps in the core processes may be grouped and thereby included in the same EPD. For such an EPD, there are three options:

- For each indicator, declare the average results of the included products. This average shall be weighted according to the production volumes of the included products, if relevant. In this option, the average content shall be declared in the content declaration.
- Declare the results of one of the included products – a representative product. The choice of the representative product shall be justified in the EPD, using, where applicable, statistical parameters. For example, the choice may be based on production volumes. In this option, the content of the representative product shall be declared in the content declaration.
- For each indicator, declare the highest result of the included products (i.e., the results of a “worst-case product”, which may be the results of one or several of the included products). In this option, the content declaration shall include the lowest amounts of recycled and biogenic content of the included products and their packaging, respectively, and the information on environmental and hazardous properties of substances shall reflect the highest share and most hazardous such substances contained in the any of the included products.

The first two options are only possible if none of the declared environmental impact indicator results differ by more than 10% between any of the included products. The third option is possible also if variations are larger than 10%.

The option chosen shall be clearly described in the EPD.

4.9.2 SECTOR EPDS

The International EPD System allows for an industry association to develop an EPD in the form of a Sector EPD. A Sector EPD declares the average product of multiple companies in a clearly defined sector in a clearly defined geographical area. Products covered in a sector EPD shall follow the same PCR and the same declared/functional unit shall be applied.

Any communication of the results from a Sector EPD should contain the information that the results are based on averages obtained from the sector as defined in the EPD. The communication shall not claim that the sector EPD results are representative for a certain manufacturer or its product.

The following information shall also be included a Sector EPD:

- a list of the contributing manufacturers that the Sector EPD covers,
- a description of how the selection of the sites/products has been done and how the average has been determined, and

- a statement that the document covers average values for an entire or partial product category (specifying the percentage of representativeness) and, hence, the declared product is an average that is not available for purchase on the market.

5 CONTENT AND FORMAT OF EPD

EPDs based on this PCR shall contain the information described in this section. Flexibility is allowed in the formatting and layout provided that the EPD still includes the prescribed information. A generic template for EPDs is available at www.environdec.com.

The EPD content shall:

- be in line with the requirements and guidelines in ISO 14020 (Environmental labels and declarations – General principles),
- be verifiable, accurate, relevant and not misleading, and
- not include rating, judgements or direct comparison with other products[9].

An EPD should be made with a reasonable number of pages for the intended audience and use.

The content of EPDs published in machine-readable format shall correspond with the content of the underlying EPD.

5.1 EPD LANGUAGES

EPDs should be published in English but may also be published in additional languages. If the EPD is not available in English, it shall contain an executive summary in English including the main content of the EPD. This summary is part of the EPD and, thus, also subject to the verification process.

5.2 UNITS AND QUANTITIES

The following requirements apply for units and quantities:

- The International System of Units (SI units) shall be used where available, e.g., kilograms (kg), Joules (J) and metres (m). Reasonable multiples of SI units may be decided in the PCR to improve readability, e.g., grams (g) or megajoules (MJ). The following exceptions apply:
  - Resources used for energy input (primary energy) should be expressed as kilowatt-hours (kWh) or megajoules (MJ), including renewable energy sources, e.g., hydropower, wind power and geothermal power.
  - Water use should be expressed in cubic metres (m^3)
  - Temperature should be expressed in degrees Celsius (°C),
  - Time should be expressed in the units most practical, e.g., seconds, minutes, hours, days or years.
  - Results of the environmental performance indicators shall be expressed in the units prescribed by the impact assessment methods, e.g. kg CO_2 equivalents.
- Three significant figures[10] should be adopted for all results. The number of significant digits shall be appropriate and consistent.
- Scientific notation may be used, e.g. 1.2E+2 for 120, or 1.2E-2 for 0.012.
- The thousand separator and decimal mark in the EPD shall follow one of the following styles (a number with six significant figures shown for illustration):
  - SI style (French version): 1 234,56
  - SI style (English version): 1 234.56

  In case of potential confusion or intended use of the EPD in markets where different symbols are used, the EPD shall state what symbols are used for thousand separator and decimal mark.
- Dates and times presented in the EPD should follow the format in ISO 8601. For years, the prescribed format is YYYY-MM-DD, e.g., 2017-03-26 for March 26th, 2017.
- The result tables shall:

[9] Therefore, results of normalization are not allowed to be reported in the EPD.

[10] Significant figures are those digits that carry meaning contributing to its precision. For example with two significant digits, the result of 123.45 shall be displayed as 120, and 0.12345 shall be displayed as 0.12. In scientific notation, these two examples would be displayed as $1.2*10^2$ and $1.2*10^{-2}$.

- Only contain values or the letters “ND” (Not Declared). It is not possible to specify ND for mandatory indicators. ND shall only be used for voluntary parameters that are not quantified because no data is available.[11]
- Contain no blank cells, hyphens, less than or greater than signs or letters (except “ND”).
- Use the value “0” only for parameters that have been calculated to be zero.
- Footnotes shall be used to explain any limitation to the result value.

5.3 USE OF IMAGES IN EPD

Images used in the EPD, especially pictures featured on the cover page, may in themselves be interpreted as an environmental claim. Images such as trees, mountains, wildlife that are not related to the declared product shall therefore be used with caution and in compliance with national legislation and best available practices in the markets in which the EPD is intended to be used.

5.4 EPD REPORTING FORMAT

The reporting format of the EPD shall include the following sections:

- Cover page (see Section 5.4.1)
- Programme information (see Section 5.4.2)
- Product information (see Section 5.4.3)
- Content declaration (see Section □)
- Environmental performance (see Section 5.4.5)
- Additional environmental information (see Section 5.4.6)
- Additional social and economic information (see Section 5.4.7)
- References (see Section 5.4.9)

The following sections shall be included, if relevant:

- Differences versus previous versions (see Section 5.4.8)
- Executive summary in English (see Section 5.4.10)

5.4.1 COVER PAGE

The cover page shall include:

- Product name and image
- Name and logotype of EPD owner
- The text “Environmental Product Declaration” and/or “EPD”
- Programme: The International EPD System, www.environdec.com
- Programme operator: EPD International AB
- Logotype of the International EPD System
- EPD registration number as issued by the programme operator[12]
- Date of publication (issue): 20XX-YY-ZZ
- Date of revision: 20XX-YY-ZZ, when applicable
- Date of validity; 20XX-YY-ZZ

[11] This requirement does not intend to give guidance on what indicators are mandated (“shall”) or voluntary.

[12] The EPD shall not include a “registration number” if such is provided by the certification body, as this may be confused with the registration number issued by the programme operator.

- A note that *"An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com."*
- A statement of conformity with ISO 14025.
- For EPDs covering multiple products: a statement that the EPD covers multiple products and a list of all products covered by the EPD.
- For Sector EPDs: a statement that the EPD is a Sector EPD.
- For construction product EPDs:

In the case of EPDs registered through a regional hub (a regional or national programme based on and fully aligned with the International EPD System through an agreement with the programme operator), "Programme", "Programme operator", and "Logotype" shall be expanded to include a reference to the regional programme and the organisation responsible for it.

Where applicable, the cover page shall also include the following information:

- Information about dual registration of EPD in another programme, such as registration number and logotype.
- A statement of conformity with other standards and methodological guides.

5.4.2 PROGRAMME INFORMATION

The programme information section of the EPD shall include:

- Address of programme operator: *EPD International AB, Box 210 60, SE-100 31 Stockholm, Sweden, E-mail: support@environdec.com*
- The following statement on the requirements for comparability of EPDs, adapted from ISO 14025: *"EPDs within the same product category but from different programmes may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison."*
- A statement that the EPD owner has the sole ownership, liability and responsibility of the EPD
- Information about verification[13] and the PCR in a table with the following format and contents:

Accountabilities for PCR, LCA and independent, third-party verification
Product Category Rules (PCR)
PCR: *<name, registration number, version and UN CPC code(s)>*
PCR review was conducted by: *<name and organisation of the review chair, and information on how to contact the chair through the programme operator>*
Life cycle assessment (LCA)
LCA accountability: *<name, organization>*
Third-party verification

[13] If the EPD has been verified by an approved individual verifier who has received contractual assistance from a certification body that is not accredited, this certification body shall not be included in this table.

Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☐ EPD verification by individual verifier Third-party verifier: *<name, organisation, and signature of the third-party verifier>* Approved by: The International EPD System
OR
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☐ EPD verification by accredited certification body Third-party verification: *<name, organisation>* is an approved certification body accountable for the third-party verification The certification body is accredited by: *<name of accreditation body & accreditation number, where applicable>*
OR
Independent third-party verification of the declaration and data, according to ISO 14025:2006 via: ☐ EPD verification by EPD Process Certification* Internal auditor: *<name, organisation>* Third-party verification: *<name, organisation>* is an approved certification body accountable for third-party verification Third-party verifier is accredited by: *<name of accreditation body & accreditation number, where applicable>* *For EPD Process Certification, an accredited certification body certifies and reviews the management process and verifies EPDs published on a regular basis. For details about third-party verification procedure of the EPDs, see GPI v4, Section 7.5.
Procedure for follow-up of data during EPD validity involves third-party verifier: ☐ Yes ☐ No

5.4.3 PRODUCT INFORMATION

The product information section of the EPD shall include:

- address and contact information to EPD owner,
- description of the organisation. This may include information on products- or management system-related certifications (e.g. ISO 14024 Type I environmental labels, ISO 9001- and 14001-certificates and EMAS-registrations) and other relevant work the organisation wants to communicate (e.g. SA 8000, supply-chain management and social responsibility),
- name and location of production site,
- product identification by name, and an unambiguous identification of the product by standards, concessions or other means,
- identification of the product according to the UN CPC scheme system. Other relevant codes for product classification may also be included, e.g.
    - Common Procurement Vocabulary (CPV),
    - United Nations Standard Products and Services Code® (UNSPSC),
    - Classification of Products by Activity (NACE/CPA),
    - Australian and New Zealand Standard Industrial Classification (ANZSIC), or

- Global Trade Item Number (GTIN).

- a description of the product,
- a description of the technical purpose of the product, including its application/intended use,
- a description of the background system, including the main technological aspects,
- for EPDs covering multiple products: a description of the selection of products/sites, a list of contributing manufacturers (if Sector EPD), etc. (see Section 0),
- geographical scope of the EPD, i.e., for which geographical location(s) of use and end-of-life the product's performance has been calculated,
- declared/functional unit,
- reference service life (RSL) and/or technical/actual lifespan, if relevant,
- declaration of the year(s) covered by the data used for the LCA calculation and other relevant reference years,
- reference to the main database(s) for generic data and LCA software used, if relevant,
- system diagram of the processes included in the LCA, divided into the life cycle stages,
- description if the EPD system boundary is "cradle-to-gate", "cradle-to-gate with options" or "cradle-to-grave",
- information on which life-cycle stages are not considered (if any), with a justification of the omission, and
- references to any relevant websites for more information or explanatory materials.

This section may also include:

- name and contact information of organisation carrying out the underlying LCA study,
- any additional information about the underlying LCA-based information, such as cut-off rules, data quality, allocation methods, and other methodological choices and assumptions,
- a description of the material properties of the product with a declaration of relevant physical or chemical product properties, such as density, etc., and
- if end-of-life treatment is not included, the EPD shall contain a statement that it shall not be used for communicating environmental information to consumers/end users of the product.

5.4.4 CONTENT DECLARATION

The content declaration section shall declare the weight of one unit of product and contain information about the content of the product in the form of a list of materials and chemical substances including information on their environmental and hazardous properties. The gross weight of each material/substance shall be declared, including a minimum of 99% of the materials/substances in one unit of product.

The content declaration does not apply to proprietary materials and substances covered by exclusive legal rights including patent and trademarks. In general, an indication that a product is "free" of a specific hazardous material or substance should be done with caution and only when relevant, following the rules in ISO 14021 on self-declared environmental claims.

Information on the hazardous properties of materials and chemical substances should follow the requirements given in the latest revision of the Globally Harmonized System of Classification and Labelling of Chemicals (GHS),[14] issued by the United Nations or national or regional applications of the GHS. As an example, the following regulations should be used for EPDs intended to be used in the European Union:

- Regulation (EC) No 1907/2006 of the European parliament and of the council of 18 December 2006 concerning the Registration, Evaluation, Authorisation, and Restriction of Chemicals (REACH); and
- Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling,

An exception to the 99% above rule is that all materials/substances hazardous to health and the environment, being carcinogenic, mutagenic or toxic to reproduction (CMR), allergic, PBT5 or vPvB6 shall be listed as such. Even if a substance does not have a classification, but is suspected to fall under any of these categories, it shall be listed as well. The verifier will check the compliance of

[14] The GHS document is available at www.unece.org.

all materials/substances to legal requirements and customer demands related to legal requirements. and packaging of substances and mixtures.

5.4.4.1. Information about recycled materials

When a product is made in whole or in part with recycled materials, the provenience of the materials (pre-consumer or post-consumer) shall be presented in the EPD as part of the content declaration. The declaration of recycled content shall be separated into pre-consumer recycled content and post-consumer recycled content.

To avoid any misunderstanding about which material that may be considered “recycled material”, the rules given in ISO 14021 shall be followed. According to ISO 14021:2001 paragraph 7.8.1.1 Recycled content and material shall be interpreted as follows:

- **Recycled content:** Proportion, by mass, of a recycled material in a product or packaging. Only pre-consumer and post-consumer materials shall be considered as recycled content, consistent with the following usage of terms.
  - Pre-consumer material: Material diverted from the waste stream during a manufacturing process. Excluded is reutilization of materials such rework, regrind or scrap generated in a process and capable of being reclaimed in the same process that generate it.
  - Post-consumer material: Material generated by household or by commercial, industrial and institutional facilities in their role as end users of the product which can no longer be used for its intended purpose. This includes returns of material from the distribution chain.
- **Recycled material:** Material that has been reprocessed from a recovered (reclaimed) material by means of a manufacturing process and made into a final product or into a component for incorporation into a product.
- **Recovered [reclaimed] material:** Material that would have otherwise been disposed of as waste or used for energy recovery, but has instead been collected and recovered [reclaimed] as a material input, in lieu of new primary material, for a recycling or a manufacturing process.

In the content declaration, the EPD owner is required to declare the recycled content calculated according to the definitions above, making sure to exclude so called “recovered” or “reclaimed” materials not derived from waste.

Some inputs may be usable products from a previous system. Usable products are commonly intermediate, discarded products, scraps or similar flows from a previous production process and they shall not be considered “recycled content” in the content declaration. These products are in fact included either in the definition of the raw materials or in the definition of the recovered products.

Allocation procedures used for such products entering the system shall be similar to the allocation procedure applied to intermediate or discarded products leaving the system (see Section A.5 in the General Programme Instructions). In particular, if economic allocation has been used for intermediate or discarded flows exiting the process, the same approach shall be applied to the input flows.

5.4.4.2. Information about bio-based carbon content

For products with bio-based content, it is recommended to declare the percentage of bio-based carbon content in relation to the total carbon content of the product. The global standard ASTM D 6866 shall be used when calculating the bio-based carbon content. The only exception is if the EPD is marketed in Europe, then EN 16640 may instead be used. If the percentage of bio-based carbon content is declared, it shall be verified that the 14C content of the batches of raw material used for the products in the EPD has been measured in accordance with the above-mentioned standards and that the test reports have been issued by an accredited laboratory for these specific test methods. The auditor shall verify that there is a precise correspondence between the batches of raw materials analysed and the products, for example through a traceability system. The declaration of the bio-based carbon content shall therefore correspond to the value of the weighted average of the batches of raw material used. The application of the traceability criterion for raw materials makes it possible to prove that a mass balance approach has not been used.

5.4.4.3. Information about packaging

Packaging materials used for plastics in primary form delivery are to be classified as:

- Distribution Packaging: packaging designed to contain one or more articles or packages, or bulk materials, for the purposes of transport, handling and/or distribution (ISO 21067-1:2016, Section 2.2.6)

An average packaging shall be modelled to be declared as part of the declared unit, referring to a weighted mean of the different packaging solutions used for delivery in the reference year by the company.

A statement of the source of the materials (pre-consumer or post-consumer) shall be presented in the EPD when the packaging is made in whole or in part by recycled materials.

5.4.5 ENVIRONMENTAL PERFORMANCE

Below subsections list the mandatory environmental performance indicators to declare in the EPD. LCA results based on additional indicators may be declared, if they are relevant for the product category, their inclusion is justified in the EPD, appropriate methods are used, and the results are verifiable. If the additional indicators appear to the reader to display duplicate information, the EPD shall contain an explanation of the differences between the declared indicators.

5.4.5.1. Environmental impacts

The EPD shall declare the environmental impact indicators, per declared unit, per life-cycle stage and in aggregated form, using the default impact categories, impact assessments methods and characterisation factors available on www.environdec.com. The source and version of the impact assessment methods and characterisation factors used shall be reported in the EPD.

Alternative regional life cycle impact assessment methods and characterisation factors may be calculated and displayed in addition to the default list. If so, the EPD shall contain an explanation of the difference between the different sets of indicators, as they may appear to the reader to display duplicate information.

5.4.5.2. Use of resources

The EPD shall declare the mandatory, and may declare the optional, indicators for resource use listed on www.environdec.com/indicators per declared unit, per life-cycle stage and in aggregated form.

5.4.5.3. Waste production and output flows

Waste generated along the whole life cycle production chains shall be treated following the technical specifications described in the GPI. The EPD may declare the optional indicators for waste production and output flows as listed on www.environdec.com/indicators per declared unit, per life-cycle stage and in aggregated form.

5.4.6 ADDITIONAL ENVIRONMENTAL INFORMATION

An EPD may declare additional environmentally relevant information, in addition to the LCA results of the section on environmental performance results. The additional environmental information may cover various aspects of specific relevance for the product, for example: the release of dangerous substances into indoor air, soil, and water during the use stage, for example:

- instructions for proper use of the product, e.g. to minimise energy or water consumption or to improve the durability of the product,
- information on recycling including, e.g. suitable procedures for recycling the entire product or selected parts and the potential environmental benefits gained,
- information on a suitable method of reuse of the product (or parts of the products) and procedures for disposal as waste at the end of its life cycle,
- information regarding disposal of the product, or inherent materials, and any other information considered necessary to minimise the product's end-of-life impacts, and
- a more detailed description of an organisation's overall environmental work, in addition to the information listed under Section 5.4.3, such as:
  - the existence of any type of organised environmental activity, and
  - information on where interested parties may find more details about the organisation's environmental work.

Any additional environmental information declared shall be substantiated and verifiable, and be derived using appropriate methods and be specific, accurate, not misleading, and relevant to the specific product. Quantitative information is preferred over qualitative information.

5.4.7 ADDITIONAL SOCIAL AND ECONOMIC INFORMATION

The EPD may also include other relevant social and economic information as additional and voluntary information. This may be product information or a description of an organisation's overall work on social or economic sustainability, such as activities related to supply chain management or social responsibility.

Any additional social and economic information declared shall be substantiated and verifiable, and be derived using appropriate methods and be specific, accurate, not misleading, and relevant to the specific product. Quantitative information is preferred over qualitative information.

5.4.8 DIFFERENCES VERSUS PREVIOUS VERSIONS

For EPDs that have been updated, the following information shall be included:

- a description of the differences versus previously published versions, and
- a revision date on the cover page.

5.4.9 REFERENCES

A reference section shall be included, including a list of all sources referred to in the EPD, including the GPI (including version number), and PCR (registration number, name, and version) and the databases used to develop the EPD.

5.4.10 EXECUTIVE SUMMARY IN ENGLISH

The executive summary, if included (see Section 5.1), shall contain relevant summarised information related to the programme, product, environmental performance, information related to pre-certified EPDs, and information related to sector EPDs. Besides this, further information may be added such as additional environmental, social or economic information, references as well as differences versus previous EPD versions.

6 LIST OF ABBREVIATIONS

ANZSIC	Australian and New Zealand Standard Industrial Classification
CPC	Central product classification
CPV	Common procurement vocabulary
EPD	Environmental product declaration
GPI	General Programme Instructions
GTIN	Global trade item number
ISO	International Organization for Standardization
LCA	Life cycle assessment
LCI	Life cycle inventory
NACE/CPA	Classification of products by activity
ND	Not declared
PCR	Product category rules
REACH	Restriction of chemicals
RSL	Reference service life
SI	The International System of Units
UN	United Nations
UNSPSC	United Nations standard products and services code

7 REFERENCES

Bastioli C (Ed.) (2005) Handbook of biodegradable polymers. Smithers Rapra Publishing.

CEN (2013) EN 15804:2012+A1:2013, Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products.

CEN (2019) EN 15804:2012+A2:2019, Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products.

ECHA (2010) Guidance on waste and recovered substances. https://echa.europa.eu/documents/10162/2324906/waste_recovered_en.pdf/657a2803-710c-472b-8922-f5c94642f836, accessed November 2023.

EPD International (2021) General Programme Instructions for the International EPD System. Version 4.0, dated 2021-03-29. www.environdec.com.

ISO (2000) ISO 14020:2000, Environmental labels and declarations – General principles.

ISO (2004) ISO 8601:2004 Data elements and interchange formats – Information interchange – Representation of dates and times.

ISO (2006a) ISO 14025:2006, Environmental labels and declarations – Type III environmental declarations – Principles and procedures.

ISO (2006b) ISO 14040:2006, Environmental management – Life cycle assessment – Principles and framework.

ISO (2006c) ISO 14044: 2006, Environmental management – Life cycle assessment – Requirements and guidelines.

ISO (2013) ISO/TS 14067:2013, Greenhouse gases – Carbon footprint of products – Requirements and guidelines for quantification and communication.

ISO (2014) ISO 14046:2014, Environmental management – Water footprint – Principles, requirements and guidelines.

ISO (2015a) ISO 14001:2015, Environmental management systems – Requirements with guidance for use.

ISO (2015b) ISO 9001:2015, Quality management systems – Requirements.

ISO (2016a) ISO 21067-1:2016, Packaging – Vocabulary – Part 1: General terms.

ISO (2016b) ISO 14021:2001, Environmental labels and declarations - Self-declared environmental claim (Type II environmental labelling).

ISO (2017) ISO 21930:2017, Sustainability in buildings and civil engineering works – Core rules for environmental product declarations of construction products and services.

ISO (2018) ISO 14024:2018, Environmental labels and declaration – Type I environmental labelling – Principles and procedures.

PlasticsEurope (2024) Eco-profiles for determining environmental impacts of plastics. https://plasticseurope.org/sustainability/circularity/life-cycle-thinking/eco-profiles-set/, accessed May 2024.

8 VERSION HISTORY OF PCR

VERSION 1.0, 2010-08-12

Original version.

VERSION 2.0, 2012-12-15

Added technical details, specific for the category, in the chapters 2 and 6.

VERSION 2.1, 2013-10-30

- Editorial changes and use of the latest PCR template
- Added link to UN CPC home page
- Update of the document to General Programme Instructions, version 2.01
  - General introduction and General information
  - Electricity production (data quality rules)
  - Indicators for environmental performance
  - EPD Validity
  - Content of the EPD

VERSION 2.11, 2015-01-27

- Editorial changes by the Secretariat

VERSION 2.2, 2017-12-21

- Validity extended with 8 months based on Section 5.5.2.1 in the General Programme Instructions version 3. The extension is done due to an urgent market need, and to allow the ongoing update of the PCR to be aligned with the latest programme instructions

VERSION 3.0, 2018-06-21

- Compliance with to the General Programme Instructions, Version 3.0.
- Major editorial changes and use of PCR template by the Guidance for PCR development

VERSION 3.01, 2019-09-06

- Clarified terms of use
- Editorial changes

VERSION 3.0.2, 2022-08-17

- The validity of this PCR has been extended until 2023-06-21, as an updating process has been initiated.
- The PCR Moderator from Quota Sette Srl has changed.
- Editorial changes in Sections **Error! Reference source not found.** to 0, to clarify the indicator list at www.environdec.com a pplies also for the indicators of resource use, waste production and other output flows.

VERSION 4.0.0, 2024-07-01

- This version incorporates the changes introduced by GPI 4.0 and reflects the current state of the sector of production and distribution of plastics in primary form.

VERSION 4.0.1, 2025-09-15

- Editorial update to clarify system boundary rules in section 4.3.1.1

ANNEX A - HS[15] 2017 and CPV[16] 2007 classifications for plastics in primary form

The products under the following codes are included in the purposes of this PCR document:

HS 2017 Code(s)

- 3901 - polymers of ethylene, in primary forms
- 3902 - polymers of propylene or of other olefins, in primary forms
- 3903 - polymers of styrene, in primary forms
- 3904 - polymers of vinyl chloride or of other halogenated olefins, in primary forms
- 3905 - polymers of vinyl acetate or of other vinyl esters, in primary forms; other vinyl polymers in primary forms
- 3906 - acrylic polymers in primary forms
- 3907 - polyacetals, other polyethers and epoxide resins, in primary forms; polycarbonates, alkyd resins, polyallyl esters and other polyesters, in primary forms
- 3908 - polyamides in primary forms
- 3909 - amino-resins, phenolic resins and polyurethanes, in primary forms
- 3910 - silicones in primary forms
- 3911 - petroleum resins, coumarone-indene resins, polyterpenes, polysulphides, polysulphones
- 3912 - cellulose and its chemical derivatives, not elsewhere specified or included, in primary forms
- 3913 - natural polymers (for example, alginic acid) and modified natural polymers (for example, hardened proteins, chemical derivatives of natural rubber), not elsewhere specified or included, in primary forms
- 3914 - ion-exchangers based on polymers of headings Nos. 39.01 to 39.13, in primary forms

CPV 2007 Code(s)

- 24500000-9 – Plastics in primary forms
- 24510000-2 - Primary-form polymers of ethylene
- 24520000-5 - Primary-form polymers of propylene
- 24530000-8 - Primary-form polymers of styrene
- 24540000-1 - Primary-form of vinyl polymers
- 24541000-8 - Primary-form polymers of vinyl acetate
- 24542000-5 - Primary-form acrylic polymers
- 24550000-4 - Primary-form of polyesters
- 24560000-7 - Primary-form polyamides
- 24570000-0 - Primary-form urea resins
- 24580000-3 - Primary-form amino-resins
- 24590000-6 - Primary-form silicone

[15] The International Convention on the Harmonized Commodity Description and Coding Systems

[16] Common Procurement Vocabulary

