

PULPS OF WOOD OR OTHER FIBROUS CELLULOSIC MATERIAL

PRODUCT CATEGORY CLASSIFICATION: UN CPC 3211.

PCR REGISTRATION NUMBER TO BE ADDED.

DRAFT VERSION 1.0 FOR OPEN CONSULTATION. DO NOT USE OR CITE.

VALID UNTIL 20XX-YY-ZZ

DRAFT PCR FOR OPEN
CONSULTATION

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INTRODUCTION TO OPEN CONSULTATION

This draft PCR is available for open consultation until 2021-08-28. Feel free to forward the draft to any other stakeholder you might think is relevant, including colleagues and other organisations.

We are interested in comments from stakeholders on:

- General
 - o Alignment with PCRs available in other programmes for type III environmental declarations, industry-specific LCA guides or similar.
- Scope of PCR
 - o Product category definition and description
 - o Classification of product category using CPC codes
- Goal and scope, life cycle inventory and life cycle impact assessment
 - o Functional unit/declared unit
 - o System boundary
 - o Allocation rules
 - o Data quality requirements
 - o Recommended databases for generic data
 - o Impact categories and impact assessment methodology
- Additional information

Comments may sent directly to the PCR Moderator (contact details available in Section 1). There is a template for comments on www.environdec.com that may be used.

For questions about the PCR, please contact the PCR moderator. For general questions about the International EPD® System, EPD or PCR development, please contact the Secretariat via pcr@environdec.com.

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1 INTRODUCTION

This document constitutes Product Category Rules (PCR) developed in the framework of the International EPD® System: a programme for type III environmental declarations¹ 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 at 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.

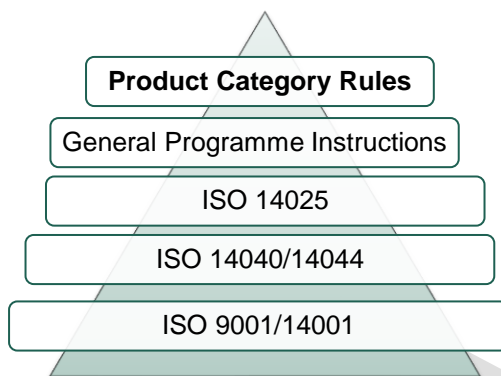


Figure 1 The hierarchy between PCRs, standards and other documents.

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 at 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.

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2 GENERAL INFORMATION

2.1 ADMINISTRATIVE INFORMATION

Name:	Pulps of wood or other fibrous cellulosic material
Registration number and version:	<i>Added by the Secretariat</i>
Programme:	 The International EPD® System
Programme operator:	EPD International AB, Box 210 60, SE-100 31 Stockholm, Sweden. Website: www.environdec.com E-mail: info@environdec.com
PCR Moderator:	Roberto Mirande Duhalde, ENCE Energía & Celulosa, rmirande@ence.es
PCR Committee:	ENCE Energía & Celulosa, Marcel Gómez Consultoría Ambiental, NOSOS
Date of publication and last revision:	<i>Added by the Secretariat</i>
Valid until:	<i>Added by the Secretariat</i>
Schedule for renewal:	<p>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.</p> <p>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.</p> <p>See www.environdec.com for the latest version of the PCR.</p> <p>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.</p>
Standards conformance:	<ul style="list-style-type: none"> ▪ General Programme Instructions of the International EPD® System, version 4.0, based on ISO 14025 and ISO 14040/14044. ▪ PCR Basic Module, CPC Division 32 Pulp, paper and paper products, etc., version 3.02 (CPC 32).
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 pulps of wood or other cellulosic material and the declaration of this performance by an EPD. The product category corresponds to UN CPC 3211 Pulps of wood or other fibrous cellulosic material.

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Pulp is a fibrous material used for papermaking produced in a pulp mill, either mechanically or chemically from fibrous cellulose raw material (wood most common) (CEPI, 2021).

This PCR covers pulp made from lignocellulosic fibrous materials derived from wood or non-wood sources (such as fibre crops or recycled materials), and which are obtained through chemical, mechanical or semi-chemical processes. Pulp made from recycled materials is included.

The classification in the UN CPC system is Subclass 3211:

Division 32 "Pulp, paper and paper products, printed matter and related articles".

Group 321 "Pulp, paper and paperboard".

Class: 3211 "Pulps of wood or other fibrous cellulosic material".

Subclasses:

- 32111 - Chemical wood pulp, dissolving grades.
- 32112 - Chemical wood pulp, other than dissolving grades.
- 32113 - Mechanical wood pulp; semi-chemical wood pulp; pulps of fibrous cellulosic material other than wood.

Recycled pulp is included in these categories.

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.

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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

This PCR is available for open consultation from **2021-06-28 until 2021-08-28**, during which any stakeholder is able to provide comments by contacting the PCR Moderator and/or the Secretariat.

Add information about any physical or web-based meetings held during the open consultation phase, if applicable.

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 at www.environdec.com:

- *To be added after the open consultation*

3.2 PCR REVIEW

3.2.1 VERSION 1.0

PCR review panel:	The Technical Committee of the International EPD® System. A full list of members is available at www.environdec.com . The review panel may be contacted via info@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:	<i>Added by the Secretariat</i>
Review dates:	<i>Added by the Secretariat</i>

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.
- SCSglobal services. <https://www.scsglobalservices.com/services/environmental-product-declarations>
- Product Environmental Footprint (PEF) initiative, European Commission <https://ec.europa.eu/environment/eussd/smgp/>

Table 1 lists the identified PCRs and other standardized methods.

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Table 1 Existing PCRs and other internationally standardized methods that were considered to avoid overlap in scope and to ensure harmonisation with established methods.

NAME OF PCR/STANDARD	PROGRAMME/ STANDARDISATION BODY	REGISTRATION NUMBER, VERSION NUMBER/DATE OF PUBLICATION	SCOPE
PCR Basic Module. Pulp, paper and paper products, etc. UN CPC 32.	The International EPD® System	Version 3.02 2019.07.26	Pulp, paper and paper products.
Product Category Rule Module for Market Pulp and Paper Products	SCSglobal services	2016	Pulp and paper products.
Product Environmental Footprint Category Rules	European Commission JRC	2018	Intermediate paper products (graphic papers, packaging papers and tissue).

3.4 REASONING FOR DEVELOPMENT OF PCR

This PCR was developed to enable publication of EPDs for this product category based on ISO 14025 and 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.

Existing PCR and standardized methods address paper and paper products, tackling pulp as part of the production chain. This PCR is focussed exclusively in the production of pulp.

Furthermore, an increasing interest of pulp producers in developing EPD, being aware of environmental implications of their activities and willing to communicate their environmental performances with transparency, emphasizes the need to develop this PCR.

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:

- NOSOS and Marcel Gómez Consultoría Ambiental, 2020. Análisis del ciclo de Vida de los productos: pasta de papel ENCELL TCF y pasta de papel NATURCELL fabricados en la biofábrica de Pontevedra. Commissioned by ENCE.
- Scientific papers based on LCA of intermediate paper products e.g. Aldrich et al (2011), Chen et al (2012), Gauldreault et al (2010), Laurijssen et al (2013), Lopes et al (2003) and M'Hamdi et al (2017).
- WRI/WBCSD Guide for Allocation of GHG Emissions from a Combined Heat and Power (CHP) Plant (2006). GHG Protocol Initiative calculation tool.

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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

This PCR uses a declared unit instead of a functional unit as the product category refers to an intermediate product which can be further processed, or combined with other products, into different end products.

The declared unit is "1 air-dried metric ton (1 ADt) of pulp and its distribution packaging". The type of pulp shall be declared together with the declared unit:

Recycled or virgin.

In case of virgin fibres:

- Sulphate, sulphite, mechanical, semi-chemical or other process.
- Bleached or unbleached.
- Softwood (SW), Hardwood (HW) or Non-Wood (NW) fibres.
- Dissolving or other than dissolving grades.

An example of declared unit is: "1 air-dried metric ton (1 ADt) pulp and its distribution packaging. The pulp is bleached sulphite, produced with hardwood fibres and paper grade."

The weight of the packaging (wrappers and packaging wires or strappings of individual bales) is included in this 1 ADt, as the gross mass as defined by ISO 801-3 is considered.

Air-dried means 90% dry matter content.

The reference flow in the LCA shall be defined at the point where the product arrives at the customer gate, i.e. any losses occurring before then must be considered.

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

Not relevant for this product category.

4.3 SYSTEM BOUNDARY

As it refers to an intermediate product, the scope of this PCR and EPDs based on it is cradle-to-gate plus the transportation to customer and the end of life of the distribution packaging.

Note: Distribution packaging is usually used as pulp, and therefore only the wires used to pack the pulp are considered as packaging waste.

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 intermediate product is divided into three life cycle stages:

- Upstream processes (from cradle-to-gate)
- Core processes (from gate-to-gate)
- Downstream processes (from gate-to customers' gate)

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In the EPD, the environmental performance associated with each of the three 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

All relevant unit processes along the upstream supply chain shall be included, for example:

- forestry, if applicable, including land use change, seedling production, silviculture (cut over clearing, soil preparation, planting, cleaning and fertilisation), logging (thinning/final felling and extraction of timber), internal transports and new seedling production. The cradle is soil preparation,
- production of fertilizers and other chemicals used in the forestry,
- sawmill, if applicable,
- recycling processes of secondary materials from other product life cycles,
- wastepaper collection and transportation to the first gathering point,
- production of, additives and other chemicals used in the core processes,
- extraction and processing of other raw materials,
- production of input components,
- relevant services, such as transport of raw materials and components along the upstream supply chain to a distribution point (e.g. a stockroom or warehouse),
- production of distribution packaging if not produced internally, and
- generation of electricity and production of fuels, steam and other energy carriers used in upstream processes.

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.

4.3.1.2. Core processes

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

- external transportation of materials and components to the manufacturing of the product under study,
- production of the product under study (pulping):
 - Virgin fiber pulp production with relevant process steps depending on the type of pulp (sulphate pulp, sulphite pulp, mechanical and semi-chemical pulp), including de-barking, chipping, cooking/groundwood pulping, refining, delignification, washing, bleaching and drying.
 - Recycled fiber pulp production, including re-pulping of collected paper, mechanical removal of impurities, de-inking, bleaching and drying.
- production of distribution packaging if no outsourced,
- building (or dismantling) of a production site, infrastructure, production and maintenance of manufacturing equipment, and personnel activities if they make up a significant share of the overall attributable environmental impact,
- end-of-life treatment of manufacturing waste, even if carried out by third parties, including transportation, and
- generation of electricity and production of fuels, steam and other energy carriers used in core processes

Core processes not listed may also be included. Manufacturing of a minimum of 99% of the total weight of the declared product including packaging shall be included.

The following processes shall not be included:

- manufacturing of production equipment, buildings and other capital goods,
- business travel of personnel,
- travel to and from work by personnel, and

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- research and development activities.

4.3.1.3. Downstream processes

All relevant unit processes shall be included, for example:

- transportation of the product to customer,
- end-of-life treatment of the distribution packaging (or parts of it, see 4.7.3.3 section), including transportation, and
- generation of electricity and production of fuels, steam and other energy carriers used in downstream processes.

4.3.2 OTHER BOUNDARY SETTING

4.3.2.1. 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.

4.3.2.2. 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 **Fel! Hittar inte referenskälla.** for further guidance.

4.3.2.3. 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.

4.3.2.4. 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

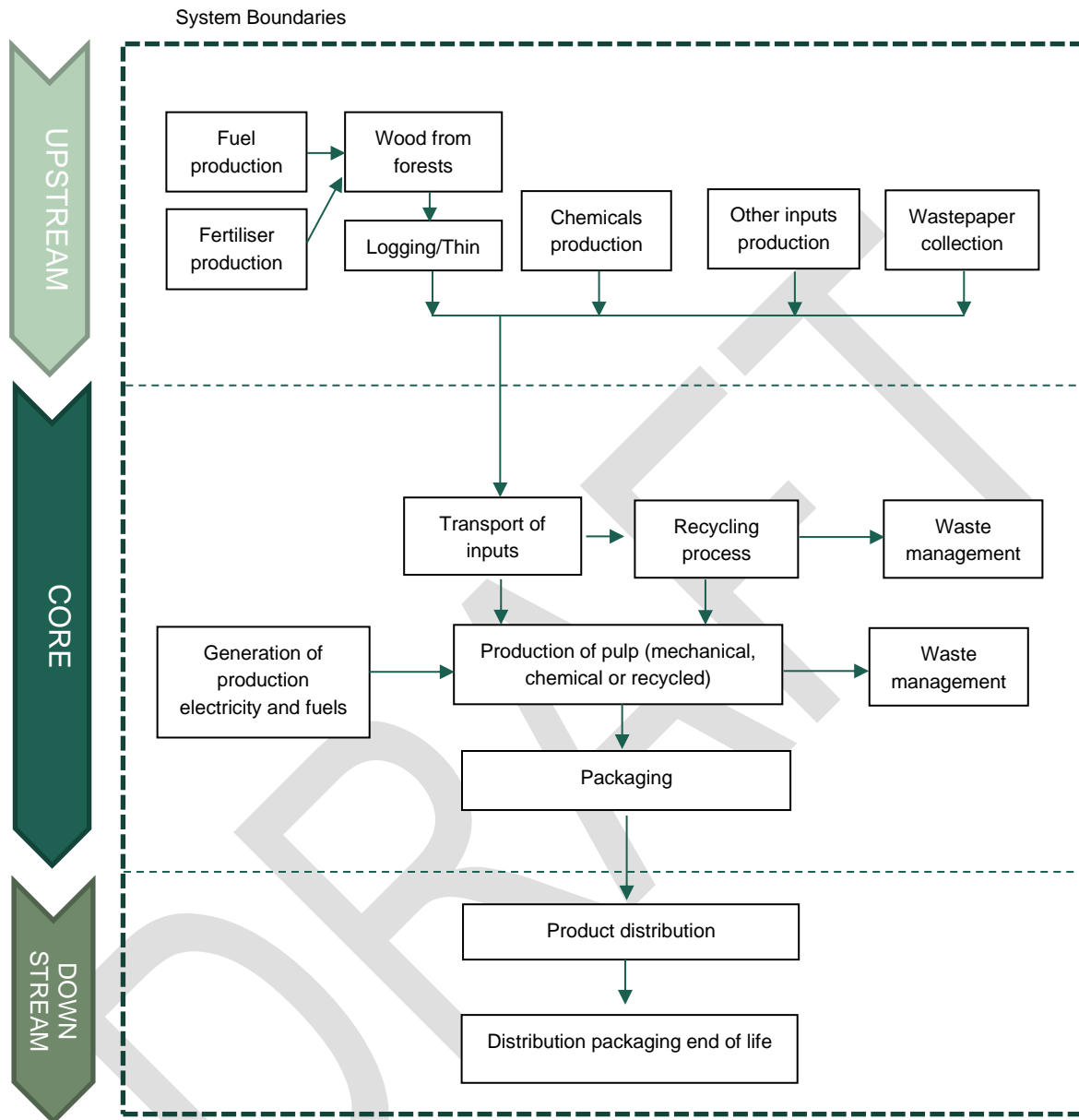


Figure 2 System diagram illustrating the processes that are included in the product system, divided into upstream, core and downstream processes.

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. Further, the cut-off shall be possible to 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.

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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 4.6.3).

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.

For key processes in the product system, Table 2 provides specific allocation guidance.

PROCESS	MAIN PRODUCT AND CO-PRODUCTS	ALLOCATION METHOD
Forestry	Wood and biomass	Physical allocation based on the dry mass of the different product outputs
Pulping	Pulp, lignin and other organic chemicals	Physical allocation based on the dry mass of the different product outputs
CHP Plants	Energy and Heat	See section 4.6.2.

Table 2 Allocation method for key processes in the product system

4.6.2 ON-SITE ELECTRICITY GENERATION: CHP PLANTS

In a Combined Heat and Power (CHP) plants, commonly referred to as “co-generation”, multiple forms of energy (most often electricity and steam) are generated simultaneously in an integrated system, from the same input fuel supply. To allocate the inventory data associated with the generation of electricity and heat in the CHP plant, the “alternative generation method” described in Appendix 1 shall be applied.

In case the company produces energy on-site in excess of the amount consumed on-site or if the company is legally entitled to sell the energy produced (as it happens currently in Spain, for instance), the system is a multifunctional situation where both pulp and energy are produced. A possible situation is that the company sells 100% of the on-site produced electricity to the electricity grid and buys from the grid the electricity required by the production system.

The method of avoiding allocation by expanding the system boundary, as advocated in ISO 14044, is not applicable within the framework of the International EPD® System due to the rationale of attributional LCA used and the concept of modularity (GPI v4.0). Taking that into consideration, the following rules shall be followed to allocate inventory data to energy and pulp:

1. If no contractual instruments have been sold to a third party and the amount of on-site electricity and/or heat produced is lesser or equal to the site’s own consumption, all the inventory data shall be allocated to the pulp production. The specific electricity mixes as generated and purchased from an electricity supplier shall be considered (see 4.7.3.2).
2. If no contractual instruments have been sold to a third party and the amount of on-site electricity and/or heat produced is in excess to the site’s own consumption, the inventory data shall be allocated to co-products considering the “alternative generation method” described in Appendix 1. The specific electricity mixes as generated shall be modelled (see 4.7.3.2).
3. If contractual instruments have been sold to a third party, the inventory data shall be allocated to co-products considering the “alternative generation method” described in Appendix 1. The specific electricity mixes as purchased from an electricity supplier shall be modelled (see 4.7.3.2).

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4.6.3 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. 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 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.

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 1% 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

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- the representativeness of the data shall be assessed to be better than $\pm 5\%$, in terms of the environmental impact calculated based on 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 3 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.

PROCESS	GEOGRAPHICAL SCOPE	DATASET	DATABASE
Miscellaneous	Varied	Varied	Ecoinvent

Table 3 Examples of databases and datasets to use for generic data.

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 an organisation has direct management control shall be specific and collected on site.
- 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 forestry the following stepwise procedure shall be applied:
 - Collect specific data from the producer/s.
 - If not applicable, and if wood is partially acquired/purchased, data for the main producer shall be used as proxy given that production practices do not diverge substantially.
 - If not applicable, or in case wood is mostly acquired/purchased and no information is available, generic data should be used by selecting reviewed studies in the same geographical context or nearby, choosing the worst range as a precautionary measure. The selection of the reference study/es shall be justified.
- For upstream processes modelled with specific data, generation of electricity used shall be accounted for in this priority:
 - 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.
 - Residual electricity mix of the electricity supplier on the market.
 - Residual electricity mix on the market.
 - Electricity consumption mix on the market.

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 may correspond a national electricity market, if this can be justified.

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

- Packaging: specific data shall be used for the distribution packaging production if it is under the direct control of the organization or if the environmental impact related to the distribution packaging production is more than 10% of the total product environmental indicators. In other cases, generic data may be used.

4.7.3.2. Core processes

- Transport from the final 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.
- 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.
- 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.
 4. Electricity consumption mix on the market. This option shall not be used for electricity used in processes over which the manufacturer (EPD owner) has direct control².

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 may correspond a national electricity market, if this can be justified.

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

- The transport of the product to the customer shall be described in the EPD, where relevant, and be accounted for in this priority:
 1. Actual transportation modes and distances to specific a customer or market, representing the geographical scope of the EPD.
 2. A weighted average of transportation modes and distances, based on transportation to several customers or markets, representing the geographical scope of the EPD.
- Waste treatment of distribution packaging. Usually, wrappers used to package pulp bales are made with pulp or paper and are processed together with the pulp by the customer. In case, wrappers are not used in the pulp transformation process and therefore are considered waste, its waste treatment shall be included as well as the waste treatment of packaging wires and strappings. Key assumptions regarding the waste treatment of distribution packaging shall be documented in the LCA report.

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/indicators), which includes both inventory indicators and indicators of potential environmental impact. The

² For electricity markets without trade of Guarantees of Origin (or similar), the residual mix will, however, be identical to the consumption mix.

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source and version of the impact assessment methods and characterisations factors used shall be reported in the EPD. Alternative regional 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.

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

Apart from the required inventory 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 PRODUCTS FROM THE SAME COMPANY

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 included in the same EPD if none of the declared environmental performance indicators differ by more than 10% between any of the included products. The results for the environmental performance indicators of one representative product shall be declared according to Section 5.4.5. The choice of representative product shall be justified in the EPD, using, where applicable, statistical parameters.

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.

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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 products³.

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:
 - Pulp shall be expressed as air-dried metric ton (ADt). Air-dried means 90% of dry matter content.
 - 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 (m³)
 - 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 CO₂ equivalents.
- Three significant figures⁴ 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.

³ Therefore, results of normalization are not allowed to be reported in the EPD.

⁴ 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*10² and 1.2*10⁻².

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- 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:
 - 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.⁵
 - 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 5.4.4)
- 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

⁵ This requirement does not intend to give guidance on what indicators are mandated (“shall”) or voluntary.

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- EPD registration number as issued by the programme operator⁶
- Date of publication (issue): 20XX-YY-ZZ
- Date of revision: 20XX-YY-ZZ, when applicable
- Date of validity; 20XX-YY-ZZ
- 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.

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: info@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 verification⁷ and the PCR in a table with the following format and contents:

Product category rules (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>
Independent third-party verification of the declaration and data, according to ISO 14025:2006: <input type="checkbox"/> EPD process certification <input type="checkbox"/> EPD verification <input type="checkbox"/> Pre-verified tool
<i>In case of certification bodies:</i> Accredited by: <name of the accreditation body and accreditation number, if applicable>.
<i>In case of individual verifiers:</i> <Name, and organisation of the individual verifier. The signature may also be included> Approved by: The International EPD® System

⁶ 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.

⁷ 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.

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The procedure for follow-up during EPD validity, as defined in the GPI, 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 4.9),
- 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

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- 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, as purchased, 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),⁸ 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, Authorization, 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, and packaging of substances and mixtures.

5.4.4.1. Information about recycled content of the pulp

When a product is made in whole or in part with recycled materials, the provenience of the materials (pre-consumer and post-consumer) shall be presented in the EPD as part of the content declaration. If applicable, the specific pre-consumer and/or post-consumer shall be declared separately.

To avoid any misunderstanding about which material that may be considered "recycled material", the guidance given in ISO 14021 shall be considered. In brief, the standard states that:

- only pre-consumer or post-consumer materials (scraps) shall be considered in the accounting of the recycled materials, and
- materials coming from scrap reutilization (such as rework, regrind, or scrap generated in a process and capable of being reclaimed within the same process that generated it) shall not be considered as recycled content.

5.4.4.2. Information about distribution packaging

The type and weight of the distribution packaging per product, shall be reported in the EPD.

In addition, the producer may declare if the packaging is made in whole or in part by recycled. If declared, a statement of the source of the materials (pre-consumer or post-consumer) shall be presented in the EPD.

5.4.5 ENVIRONMENTAL PERFORMANCE

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 at www.environdec.com/indicators. 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.

⁸ The GHS document is available at www.unece.org.

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5.4.5.2. Use of resources

The EPD shall declare the indicators for resource use listed at 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 shall declare the indicators for waste production and output flows as listed at www.environdec.com/indicators per declared unit, per life-cycle stage and in aggregated form.

5.4.6 ADDITIONAL ENVIRONMENTAL INFORMATION

If applicable, the EPD shall declare the amount (% in volume) of wood used annually for producing pulp which is certified according to sustainable forestry schemes. The name of the certification programme shall be declared as well.

If applicable, the EPD shall declare the water risk indicator as defined by WRI of the regions where the used wood is extracted. Aqueduct Country Rankings are available at national and sub-national levels at www.wri.org/aqueduct.

An EPD may declare additional environmentally relevant information not derived from the LCA-based calculations, such as:

- the release of dangerous substances into indoor air, soil, and water during the use stage,
- instructions for proper use of the product, e.g. to minimise energy or water consumption or to improve the durability of the product,
- instructions for proper maintenance and service of the product, e.g. to minimise energy or water consumption or to improve the durability of the product,
- information on key parts of the product that determine its durability,
- 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

When applicable, the EPD shall declare the amount (% in volume) of wood used annually for producing pulp which is produced by small-scale forestry run by individuals or families.

When applicable, the average transport distance and transport media used to transport the wood from the forests to the production site shall be declared.

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.

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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) 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.

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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

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- ISO (2015a) ISO 14001:2015, Environmental management systems – Requirements with guidance for use.
- ISO (2015b) ISO 9001:2015, Quality management systems – Requirements.
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8 VERSION HISTORY OF PCR

This is the first version of this PCR.

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APPENDIX 1 – ALLOCATION BY THE “ALTERNATIVE GENERATION METHOD”

This Appendix describes the allocation method for distributing the environmental impact associated with the generation of electricity and heat in a Combined Heat and Power (CHP) plant, also known as “co-generation”.

The method is based on the recommendation of WRI/WBCSD in its Guide for Allocation of GHG Emissions from a CHP plant (2006), as part of the WRI/WBCSD GHG Protocol Initiative calculation tool (2014). This method is also allowed by the Government of UK for apportioning fuel to heat and power in CHP plants (2020 Government greenhouse gas conversion factors for company reporting).

According to the “Alternative Generation Method” (also known as “efficiency method” or “power station displacement method”), inventory data are allocated based on the energy inputs used to produce the separate steam and electricity products. The method assumes that conversion of fuel energy to steam energy is more efficient than converting fuel to electricity. It also assumes that the electricity and/or heat generated by the CHP displace electricity and/or heat generated by conventional power / heat plants with an agreed efficiency. Then, the energy input of the CHP is allocated to heat and power generation according to the ratio of the efficiency of the CHP conversion relative to the efficiency of the reference technology.

The choice of parameters for the alternative generation facilities has a direct impact on how the environmental impact is distributed. The use of source-specific efficiency factors for conventional power and/or heat plants is recommended. If source-specific factors are unavailable, use a typical national default efficiency factors where the CHP system is located, and which refer to the same type of technology and fuel as the facility studied.

The International Energy Agency (IEA) publishes data regarding the annual electricity generation by fuel and the associated fuel input. Examples of published efficiency factors for EU countries are available in the EU Displacement Mix Report published by FfE Research Center for Energy Economics (2018)⁹. The US EPA assumes efficiencies of 0.33 for typical power production and 0.8 for typical steam production¹⁰.

For district heating systems, where the location of use of the heat is some distance from the point of production, there are distribution energy losses. These losses are typically around 5%, which need to be factored into the calculation of overall environmental impact where relevant (GOV UK, 2020)¹¹.

EXAMPLE (from PCR 2011:18, version 2.12. 2020-05-28).

Existing combined heat and power generation plant for which the allocation is to be made:

Electricity generation, net 30 units
Heat generation, net 60 units

Alternative generation facilities:

Heat generation $\eta_h = 90\%$ (no flue gas condensation)
Electricity generation $\eta_e = 40\%$

Fuel used by alternative electricity generation $30/0.4 = 75$
Fuel used by alternative heat generation $60/0.9 = 67$
Total fuel used by alternative generation 142

Allocate to electricity: $75/142 \Rightarrow 53\%$
Allocate to heat: $67/142 \Rightarrow 47\%$

Allocate total emissions and divide by the kWh produced of electricity and heat respectively to get specific emissions.

⁹ FfE Research Center for Energy Economics (2018). EU Displacement Mix. A simplified marginal method to determine environmental factors for technologies coupling heat and power in the European Union. Final report, May 2018.
https://www.cogeneurope.eu/images/2018_05_15_FfE_EU-Displacement-Mix_Final-Report.pdf (report accessed on 2021/04/22).

¹⁰ Source: <https://www.epa.gov/chp/chp-benefits> (web accessed on 2021/04/22).

¹¹ Department for Business, Energy & Industrial Strategy, Government of UK. 2020. Government greenhouse gas conversion factors for company reporting. Methodology Paper for Conversion factors Final Report.

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