PRODUCT CATEGORY RULES (PCR)
DATE 2023-03-29

PREPARED AND PRESERVED VEGETABLE AND FRUIT PRODUCTS, INCLUDING JUICE

PRODUCT CATEGORY CLASSIFICATION: UN CPC 213, 214

2019:10
VERSION 2.0

VALID UNTIL 2027-03-29

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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 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 at http://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.

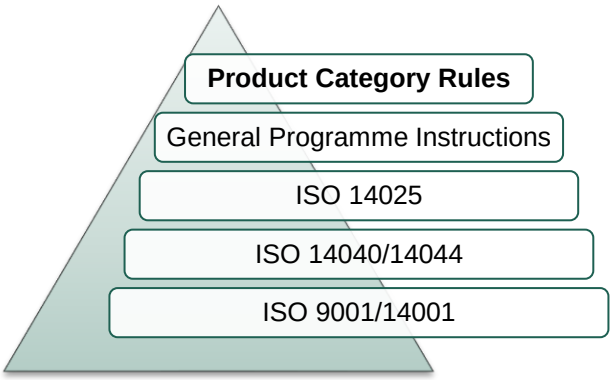

Figure 1 The hierarchy between PCRs, standards and other documents. EN 15804 and ISO 21930 are normative standards for construction products only.

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 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.

2 GENERAL INFORMATION

2.1 ADMINISTRATIVE INFORMATION

Name:	*Prepared and preserved vegetable and fruit products, including juice*
Registration number and version:	2019:14, version 2.0
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:	Adriana Del Borghi (adriana.delborghi@unige.it) CESISP, TETIS Institute Srl, University of Genoa, Italy
PCR Committee:	▪ CESISP (Centre for the Development of Product Sustainability) - University of Genoa, Italy www.cesisp.unige.it ▪ TETIS Institute Srl -Spin Off of the University of Genoa http://www.tetisinstitute.it ▪ Conserve Italia Soc. Coop. Agricola, Italy www.conserveitalia.it
Date of publication and last revision:	2023-03-29 (version 2.0) For a version history, see Section 8
Valid until:	2027-03-29
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 Template to GPI 4.0
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 Prepared and preserved vegetable and fruit products, including juice and the declaration of this performance by an EPD. The product category corresponds to UN CPC 213 and 214.

The scope of this PCR is *Prepared and preserved vegetable and fruit products, including juice*, as defined by the following subclasses under ISIC – CPC's classification:

- Section: 2 - Food products, beverages and tobacco; textiles, apparel and leather products
- Division: 21 - Meat, fish, fruit, vegetables, oils and fats
  - **Group: 213 - Prepared and preserved vegetables, pulses and potatoes**
    - **Class 2131 Frozen vegetables, pulses and potatoes**
    - **Class 2132 Vegetable juices**
    - **Class 2133 Vegetables provisionally preserved**
    - **Class 2134 Vegetables, pulses and potatoes, preserved by vinegar or acetic acid**
    - **Class 2139 Other prepared and preserved vegetables, pulses and potatoes**
  - **Group: 214 - Prepared and preserved fruit and nuts**
    - **Class 2141 Dried fruit**
    - **Class 2142 Shelled nuts**
    - **Class 2143 Fruit Juices**
    - **Class 2149 Other prepared and preserved fruit and nuts**

The product category includes prepared and preserved vegetables, pulses, potatoes (e.g. tomato and other vegetables juice, frozen legumes, prepared and preserved legumes, ready-made meals and dishes with vegetables, pulses or potatoes as main ingredients, dried vegetables, mushrooms and truffles) and fruit and nuts (e.g. dried apples and other fruits or mixtures of nuts or dried fruit, nuts, groundnuts and other seeds, orange, grapefruit, pineapples, peaches and other fruit juices, pineapples, peaches and other prepared and preserved fruit, jams, fruit jellies, marmalades, nut pastes), packaged in different packaging materials.

The product group of this PCR also includes all the types of plant dairy (e.g. almond milk, soy milk, coconut milk and rice milk, soy yogurt, soy cheese) and mixture of fruit and vegetables juices for which no CPC classification appears to be available.

More information is available at *https://unstats.un.org/unsd/classifications/Family/Detail/1074*

Check www.environdec.com/PCR for availability of PCRs that cover these product 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.

During the validity period surveillance follow-up shall be conducted with a contracted verifier in order to evaluate if the content is still consistent with the current situation. It is not necessary to perform a full LCA, only the monitoring of main parameters is requested. The surveillance verification could be organised as documental check aimed to the evaluation of the main environmental aspects relevant for the LCA calculation.

During the validation maintenance procedure, at least the following parameters should be monitored:

1. crop yield,
2. fertilizers,
3. fuel consumption,
4. water consumption,
5. electricity consumption,
6. product composition,
7. packaging.

To update the EPD, among the aforementioned data, data from 1 to 4 shall be compared with a consolidated average of at least 3 years in order to dampen the variability of agricultural data, strongly influenced by annual climatic conditions.

Specifically, the following procedure shall be followed:

- yearly data on crop yield, fertilizers, water and fuel consumption in cultivation phase,
- calculated averages including such collected data as presented above,
- use these averages to check whether there is no increase of 10% or more of any of the declared indicators of environmental impact. If the EPD shall be updated, data from 1 to 7 shall be referred to a specific representative year.

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

This PCR was available for open consultation from 2019-04-18 until 2019-05-18, 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.

3.1.2 VERSION 2.0

This PCR was available for open consultation from 2022-10-05 until 2022-12-05, during which any stakeholder was able to provide comments by contacting the PCR Moderator and/or the Secretariat.

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.

3.2 PCR REVIEW

3.2.1 VERSION 1.0

3.2.2

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 info@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:	Filippo Sessa
Review dates:	2019-08-15 until 2019-09-19

3.2.3 VERSION 2.0

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:	Nasser Ayoub
Review dates:	2022-12-20 until 2023-02-23

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.
- PEP ecopassport®. http://www.pep-ecopassport.org/create-a-pep/produce-a-lca/
- Japan Environmental Management Association for Industry (JEMAI). http://www.ecoleaf-jemai.jp/eng/pcr.html
- UL Environment. https://industries.ul.com/environment/transparency/product-category-rules-pcrs#uledev
- EPD Italy https://www.epditaly.it/pcr-in-via-di-sviluppo/
- European Commission Product Environmental Footprint (PEF) initiative

No existing PCRs or other relevant internationally standardised methods with overlapping scopes were identified. This PCR document can be potentially connected to the following PCR document in the International EPD® System:

- 2019:01, Fruits and nuts (CPC 013)
- 2020:07, Arable and vegetable crops (CPC 011, 012, 014, 017, 0191)

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 unit, system boundary, allocation methods, impact categories, data quality rules, etc.) were primarily based on the following underlying studies:

- CESISP (2014). The Water Footprint, Ecological Footprint and Carbon Footprint of vegetal products - Conserve Italia soc. coop. agr.
- CESISP (2018). Life Cycle Assessment of fruit and vegetable products - EPD PROCESS - Conserve Italia soc. coop. agr.
- Del Borghi A., Gallo M., Strazza C., Del Borghi M. “An evaluation of environmental sustainability in the food industry through Life Cycle Assessment: the case study of tomato products supply chain”. Journal of Cleaner Production 78(2014) 121-130. https://doi:10.1016/j.jclepro.2014.04.083
- Del Borghi A., Strazza C., Magrassi F., Taramasso A.C., Gallo M., Life Cycle Assessment for eco-design of product-package systems in the food industry–The case of legumes. Sustainable Production and Consumption 13 (2018) 24-36, https://doi.org/10.1016/j.spc.2017.11.001)
- Del Borghi A., Tacchino V., Moreschi L., Matarazzo A., Gallo M. and Arellano Vazquez D., Environmental assessment of vegetable crops towards the water-energy-food nexus: A combination of precision agriculture and life cycle assessment, Ecological Indicators 140 (2022), https://doi.org/10.1016/j.ecolind.2022.109015

All these studies have been used as a reference for the definition of system boundaries and impact categories of this PCR.

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 packaged product consumed in household or business (the weight of packaging not included in this 1 kg). In the case of drinkable products, information shall also be given on how to convert the weight into a corresponding amount in litres.

The reference flow shall be defined the at the customer gate, at the shelf or the retailer or the marketplace.

The declared unit shall be declared in the EPD. The environmental impacts shall be given per declared unit. A description of the function of the product should be included in the EPD®, if relevant.

This PCR uses a declared unit instead of a functional unit as all functional and qualitative aspects are not possible to capture in the same unit. These aspects should be taken into consideration when comparing EPDs based on this PCR.

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

The shelf life of the product shall be reported as product information.

4.3 SYSTEM BOUNDARY

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

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 three life cycle stages:

- Upstream processes (from cradle-to-gate)
- Core processes (from gate-to-gate)
- Downstream processes (from gate-to-grave)

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

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

- production of seeds, cuttings or plants for the cultivation,
- production of agricultural inputs, such as fertilizers and plant protection products/pesticides used in the agriculture,
- cultivation phase (e.g. land preparation, planting operation, irrigation, fertilization, plant protection products application, harvesting),
- emissions from fertilizers and plant protection products/pesticides application,
- generation of energy wares used in agriculture, at the farm,

- production of ingredients, preservatives, emulsifiers and additives used in the product,
- production of auxiliary products used such as detergents for cleaning, refrigerating etc.,
- production of primary, secondary and tertiary packaging materials,
- cold chain operation (where applicable).

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.

Cultivation phase of fruit and nuts can be modelled including two different processes: orchard preparation, fruit and nuts cultivation.

4.3.1.1.1. Orchard preparation

This phase includes all the activities occurring during the orchard preparation. The following activities shall be considered:

- oil preparation,
- fertilizers production,
- air, water and soil emissions due to the fertilizers use,
- cropping operation and related use of energy (such as diesel for tractors),
- water consumption,
- pesticide production and use.

Data used for the calculation of the environmental impacts due to this phase could be collected by the literature but shall be as specific as possible.

Impacts related to orchard preparation shall be related to the expected production considering the whole production period. The hypotheses made on the orchard lifetime and on the expected production shall be declared in the EPD.

4.3.1.1.2. Fruit and nuts cultivation and harvest

This phase includes all the activities carried out between two different fruit picking cycles. The following activities shall be considered:

- oil preparation,
- fertilizers production,
- air, water and soil emissions due to the fertilizers use,
- cropping operation, fruit and nuts picking and related use of energy (such as diesel for tractors),
- water consumption,
- pesticide production and use.

4.3.1.2. Core processes

Core module includes all the relevant processes managed by the Organization proposing the EPD. The following unit processes are part of the product system and shall be classified as core processes:

- transportation of fruits and vegetables from field to processing plants,
- transportation of semi-products to processing plants,
- transportation of primary packaging to processing plants,
- food processing (FAO, 1995):

- Vegetables (e.g. vegetables washing, sorting, peeling and coring, heat blanching, drying and dehydration, vegetable juices and concentrated products processes, cooking by steaming or boiling, freezing).

- Fruits (e.g. fruits washing, sorting, trimming and peeling, cutting, antioxidant treatments, drying and dehydration, semi- processed fruit production, fruit sugar preserves processes - jams, jellies, marmalade, fruit paste; fruit juice processes; freezing)

- Nuts (e.g. nuts shelling, roasting, grinding, mixing)

- packaging processes (e.g. filling, canning or other airtight packaging by vinegar or acetic acids, heat treatment, cooling, labelling),
- cold or frozen storage (where applicable),
- wastewater treatment,
- waste treatment of waste generated during manufacturing,
- impacts caused by the electricity production used in the core processes according to the electricity rules indicated in Section 4.7.3.2,
- impacts generated by the production of the fuels burned in the 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,
- research and development activities.

4.3.1.4.1. Freezing

This phase includes all the activities occurring during product freezing. According to FAO (2005), the following activities shall be considered:

- prefreezing stage,
- freezing period,
- reduction to storage temperature.

4.3.1.3. Downstream processes

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

- cold storage (where applicable),
- transportation from final production plants to an average distribution platform (weighted average),
- primary packaging end-of-life, including transportation.

4.3.2 INFRASTRUCTURE AND CAPITAL GOODS

In general, the production and end-of-life processes of infrastructure or capital goods[2] 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

[2] 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

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.

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.

In the case of processes performed in different countries, this should be clearly stated and the method used for calculating the average environmental impacts shall be explained in the LCA.

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.

4.4 SYSTEM DIAGRAM

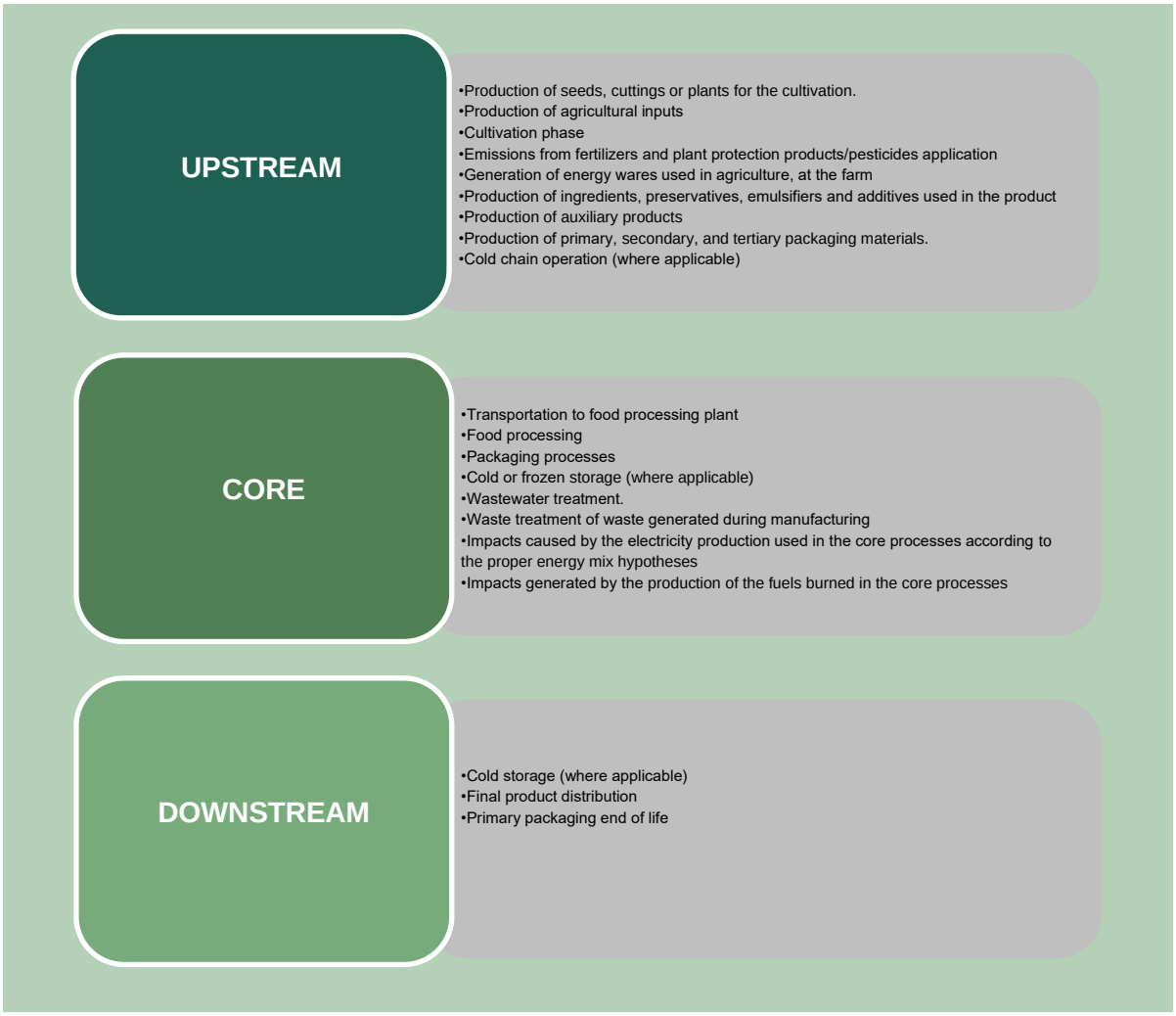

Figure 2 *System diagram illustrating the processes that shall be included in the product system, divided into upstream, core and downstream processes. The illustration of processes to include may not be exhaustive.*

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. 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.

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).

Products not compliant to the quality requirements and other by-products (e.g. peels, seeds, crop residues) sold as pet and livestock feed or sent to organic waste treatment shall be considered as by-products. Environmental impacts related to their management and treatment should not be included in the system boundaries,

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 1 provides specific allocation guidance.

PROCESS	MAIN PRODUCT AND CO-PRODUCTS	ALLOCATION METHOD
Cultivation phase	Different co-products of the same crop Different crops	Economic allocation
Food processing	Different fruit and vegetable products	Mass allocation

Table 1 Allocation method for key processes in the product system

Allocation always implies valuation and the main goal for the allocation choices made for this product category is to keep the allocation methodology rather simple but transparent and maintain comparability between EPDs.

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. 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.

Wastewater treatment shall be included in the system boundaries. The use of wastewater sludge (e.g. as organic fertilizer) shall not be considered,

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.

Any data used should preferably represent average values for a specific reference year. However, the way these data are generated could vary, e.g. over time, and in such cases they should have the form of a representative annual average value for a specified reference period. Such deviations should be declared.

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
- 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.

Selected generic data may be used for:

- semi-products manufacturing when performed by external suppliers

Proxy data may be used for:

- production of seeds, cuttings or plants for the cultivation,
- heavy metals emissions to agricultural soil, surface water and ground water,
- pesticide emissions,

- production of flavours added.

Suggested methodological guidelines for the above mentioned heavy metals and pesticide emissions are described in the Technical Report “Methodological Guidelines for the Life Cycle Inventory of Agricultural Products. Version 2.0, July 2014. World Food LCA Database (WFLDB)” (https://www.researchgate.net/project/World-Food-LCA-Database)

4.7.2 EXAMPLES OF DATABASES FOR GENERIC DATA

Table 2 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
Steel	Europe	-	Worldsteel www.worldsteel.org
Primary copper Copper products	Europe	-	ICA (International Copper Association) www.copperinfo.com ECI (European Copper Institute – Life Cycle Centre) www.copper-life-cycle.org
Electricity	Europe	-	Data combined with IEA (International Energy Agency) statistics on electricity generation mixes for nations, regions etc. www.iea.org/Textbase/stats/index.asp AIB (Association of Issuing Bodies) European residual mix: https://www.aib-net.org/facts/european-residual-mix
Aluminium	Europe	-	EAA (European Aluminium Association) www.aluminium.org
Plastics	Europe	-	PE Plastics Europe (former APME Association of Plastics Manufacturers in Europe) www.plasticseurope.org
Chemicals	Europe	-	PE Plastics Europe (former APME Association of Plastics Manufacturers in Europe) www.plasticseurope.org
Transports	Europe	-	NTM (Network for Transport and Environment) or regional alternatives www.ntm.a.se/eng-index.asp
Building materials and products	Europe	-	BEES (Building for Environmental and Economic Sustainability www.bfrl.nist.gov/oae/software/bees.html
Waste management	Europe	-	European Reference Life Cycle Data System" (ELCD) http://lca.jrc.ec.europa.eu/

Table 2 Examples of databases and datasets to use for generic data

In other parts of the world, other databases may be more appropriate.

Other data that fulfil the data quality requirements may also be used. Data quality assessment shall also be performed for the data sets in the listed database by an LCA practitioner

If there are no site or region-specific data available, emissions due to fertilizer use shall be calculated according to the rules described by PCR for CPC 011, 012, 014, 017 and 019 ("Arable and vegetable crops").

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 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 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. 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 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 shall be used for the consumer packaging production if it is under the direct control of the organization or if the environmental impact related to the consumer packaging production is more than 10% of the total product environmental indicators. In other cases, generic data may be used. When consumer packaging shows the organization's logo, the LCA report should report the exerted/non-exerted direct control on the production of consumer packaging by the organization.
- Cultivation: specific data should be used for: crop yield, water consumption, fuel consumption, fertilizers and pesticides consumption
- For raw materials cultivation please refer to the existing PCRs:
  - PCR 2020:07 CPC 011, 012, 014, 017 and 0191 Arable and vegetable crops
  - PCR 2019:01 Fruits and nuts

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.
- Goods: 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.
- Services: Specific data shall be used for the consumption of materials, chemicals, steam, heat, electricity, etc., necessary for execution of the service
- If several production plants/farms are involved in the production chain, an average virtual plant/farm shall be defined by accounting for the annual production (expressed in mass) as the weighting factor
- 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 control[3].

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.

4.7.3.2.1. Cold or frozen storage

The following requirements apply to the core processes.

Since the impacts of cold storage could be quite variables, the following hypotheses shall be used (source www.lcafood.dk).

Electric energy due to the cold storage shall be evaluated by the following formula:

$E_p = E_s \times (100\% / u) \times V_p \times t$

where:

- E_s is the specific energy consumption of the cooling room (kWh per m^3 per day)
- u is the degree of utilization of the storage room (%)
- V_p is the volume of the considered product (m^3).
- t is the time of the storage (days).

As suggested by the cited source, values could be set to:

- E_s = 0.59 kWh per m^3 per day if the product is stored in a cold place (5°C);
- E_s = 0.63 kWh per m^3 per day if the product is stored in a frozen place (-20°C);
- u = 50%
- V_p = 0.001 m^3 (1 litres). In case of different value, for example in the case of concentrate, different hypotheses could be used.
- t = shelf life of the product (days).

An average energy mix according to the electricity rules indicated in Section 4.7.3.2 representing the market place for the DU shall be used. Other hypotheses could be used but they have to be stated in the EPD.

Any deviation from these rules must be declared in the LCA and in the EPD.

The use of the energy mix in the region/country where the product is sold and then used shall be approximated as the OECD electricity mix. For non-OECD countries, in order to adopt a suitable region- or country-specific electricity mix (reflecting approximately the region(s)/countries' share) a similar precision will be required. The mix shall be documented.

4.7.3.3. Downstream processes

- Data for the use stage are usually based on scenarios, but specific data should be used when available and relevant.
- Data on the emissions from the use stage should be based on documented tests, verified studies in conjunction with average or typical product use, or recommendations concerning suitable product use. Whenever applicable, test methods shall be internationally recognised.
- If the product needs a cold or frozen storage at customer or at retail site for preserving its shelf life, the environmental impacts related to this process shall be estimated according to the rules described in Section 4.7.3.3.1.

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

- The use of electricity in the region/country where the product is used (as specified in the geographical scope of the EPD) shall be accounted for in the following priority:

1. Residual electricity mix on the market.
2. 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 production 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 downstream processes shall be documented in the EPD, where relevant.

- The transport of the product to the customer/retail site 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.
3. Calculated as a fixed long transport with the following hypothesis:
   a. Local supply chain: 1 000 km by truck,
   b. Intracontinental supply chain: 3 500 km by truck and 5 000 km by ship

- Scenarios for the end-of-life stage shall be technically and economically practicable and compliant with current regulations in the relevant geographical region based on the geographical scope of the EPD. Key assumptions regarding the end-of-life stage scenario shall be documented in the LCA report.
- End-of-life scenarios for packaging shall be defined in the EPD.

4.7.3.3.1. Cold or frozen storage

See Section 4.7.3.2.1 for calculation. For the estimation of energy consumption of the product conservation in the domestic refrigerator of the final user the following hypothesis shall be used:

- Annual energy consumption of the refrigerator (A class4): 300 kWh
- Average mass of products stored in refrigerator: 10 kg

Estimated consumption of energy per kg of product according to the described hypothesis: = 300 kWh*(365 days)$^{-1}$*(10 kg)^{1}= 0,082 kWh*day^{-1} * kg^{-1}

Average permanence of the product in the refrigerator: half of the declared shelf life.

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 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.

See Section 5.4.5 for all the indicators to be declared in the EPD.

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 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 in 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[4].

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.
  - Land use: could be used hectare (ha) in some data about crops yields. Results shall be reported in square meter (m2)
  - Fuel consumption in agricultural activities: data could be reported in litres (l),
  - 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 figures5 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.

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

[5] 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 $1.2*10^{-2}$.

- 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.[6]
  - 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)
- References (see Section 5.4.9)

The following sections may be included:

- Additional environmental information (see Section 5.4.6)
- Additional social and economic information (see Section 5.4.7)

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

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

- EPD registration number as issued by the programme operator[7]
- 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.

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: 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 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[8] 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: ☐ EPD process certification ☐ EPD verification ☐ Pre-verified tool

[7] 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.

[8] 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.

In case of certification bodies: Accredited by: *<name of the accreditation body and accreditation number, if applicable>.* *In case of individual verifiers:* *<Name, and organisation of the individual verifier. The signature may also be included>* Approved by: The International EPD® System
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 unit,
- shelf life (Section 4.2),
- 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,

- vegetable, fruit and nuts species (and the variety, if relevant) and cultivation system (i.e. conventional or organic, open field or greenhouse) shall be specified. Food processing phase shall be described. For fruit juices, the fruit percentage in the final product shall be declared,
- details on packaging shall be given providing at least the following information: container size (e.g. 330 g, 400 g, 1,000 g), type (e.g. glass bottle, steel tin can, carton-based container), sell unit and pack format (i.e. cardboard cluster pack).

This section should 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,
- WEF indicator (Del Borghi et al., 2020), specifying the calculation method,
- a description of any Carbon farming practices (e.g tillage, biochar,etc), (COM (2021) 800 Sustainable Carbon Cycles),
- estimation of carbon uptake in the cultivation phase and the net GHG value referred to FU.

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. In order to provide the customer with a complete set of the information about the food, the typical nutritional values shall be stated in the same section.

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),[9] 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, and packaging of substances and mixtures.

In the EPD the protein/colorie content shall be declared per FU.

5.4.4.1. Information about packaging

As packaging is strongly connected with the product, the producer shall provide information about packaging in the EPD, when applicable. Packaging may 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)

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

- Consumer Packaging: packaging constituting, with its content, a sales unit for the final user or consumer at the point of retail (ISO 21067-1:2016, Section 2.2.7).

Consumer packaging is generally the outcome of eco-design processes, or other activities, under direct control of the organisation. Many critical categories with strict legal requirements belong to consumer packaging category like food contact packaging and pharmaceutical packaging.

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

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

5.4.5.1. Environmental impacts

The EPD shall declare the environmental impact indicators, per declared unit, per life-cycle stage (for the upstream processes the results shall be divided between the agricultural and packaging phase, while for the downstream processes between distribution and end of life) 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.

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 (for the upstream processes the results shall be divided between the agricultural and packaging phase, while for the downstream processes between distribution and end of life) in aggregated form.

For this PCR the two indicators "Secondary materials" and "Net use of fresh water" are mandatory and not optional. Only the indicators "Renewable and non-renewable secondary fuels" are optional.

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 http://www.environdec.com/indicators per declared unit, per life-cycle stage (for the upstream processes the results shall be divided between the agricultural and packaging phase, while for the downstream processes between distribution and end of life) and in aggregated form.

The indicators for waste production and other output flows listed at http://www.environdec.com/indicators are mandatory and not optional.

5.4.5.4. Other environmental indicators

The following indicators shall be reported in the EPD, per declared unit, per life-cycle stage (for the upstream processes the results shall be divided between the agricultural and packaging phase, while for the downstream processes between distribution and end of life):

- **Land use**: m2a (in case of land occupation)
  - Volume and/or surface used of specified land category according to Corine Land Cover Classes level one at a minimum - 5 classes
  - Number of years that the areas are occupied since the orchard planting/plant building

The following issues should be addressed.

- **Human toxicity**. This category concerns effects of toxic substances on the human environment. Characterisation factors, Human Toxicity Potentials (HTP), are calculated with USES-LCA, describing fate, exposure and effects of toxic substances for an infinite time horizon. For each toxic substance HTP's are expressed as 1,4-dichlorobenzene equivalents/ kg emission.
- **Freshwater aquatic eco-toxicity**. This category indicator refers to the impact on fresh water ecosystems, as a result of emissions of toxic substances to air, water and soil. Eco-toxicity Potential (FAETP) is calculated with USES-LCA, describing fate, exposure and effects of toxic substances. The time horizon is infinite. Characterisation factors are expressed as 1,4- dichlorobenzene equivalents/kg emission.
- **Ecological footprint**. This category indicator is a complex indicator that measures the biologically productive areas for which a population, a person or a product competes. It measures the ecological assets that a given population or product requires to produce the natural resources it consumes (including plant-based food and fiber products, livestock and fish products, timber and other forest products, space for urban infrastructure) and to absorb its waste , especially carbon emissions. The Ecological Footprint tracks the use of productive surface areas. Typically these areas are: cropland, grazing land, fishing grounds, built-up land, forest area, and carbon demand on land. It is expressed in soil use over time (m2a). The Ecological Footprint indicator is closely connected with agricultural products as it determines how much resources are used in the production of each product.

The following issue could be addressed.

- **Water Energy Food (WEF) Nexus Indicator.** A unique indicator which takes into account the link between water, energy and food (Del Borghi et al., 2020). The calculation method shall be specified.

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:

- Recycling of primary packaging: recommendations for the responsible and correct recycling of packaging materials and the potential environmental impacts and benefits of recycling of primary packaging.
- 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.

The additional environmental information shall not include LCA results, with some exceptions:

- If the EPD owner wants to display results of several scenarios for use or end-of-life stages, the most representative scenario (for the geographical scope of the EPD) shall be declared in the section on environmental performance results, and the other scenarios shall be declared in the section on additional environmental information.

- The LCA results of an alternative modelling approach may be declared as additional environmental information, if such an alternative modelling approach is explicitly allowed by the applicable PCR or the GPI. According to this PCR, alternative GWP-biogenic results may be declared, which considers the effect of long-term storage of biogenic carbon (this effect shall not.

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) used to develop the EPD.

- The underlying LCA
- The PCRs used
- Other documents that verify and complement the EPD
- Instruction for recycling
- Programme instructions
- Sources of additional information

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
FAETP	Freshwater Aquatic Eco-Toxicity Potential
GHS	Globally Harmonized System of Classification and Labelling of Chemicals
GPI	General Programme Instructions
GTIN	Global trade item number

HTP	Human Toxicity Potentials
ISO	International Organization for Standardization
Kg	kilogram
kWh	kilowatt hour
LCA	Life cycle assessment
LCI	Life cycle inventory
MJ	Megajoule
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
WEF	Water Energy Food

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8 VERSION HISTORY OF PCR

VERSION 1.0, 2019-09-25

Original version published.

VERSION 1.01, 2019-10-07

Editorial changes throughout the document (as incorrect version of version 1.0 was accidently uploaded).

VERSION 2.0, 2023-YY-ZZ

- Updated in accordance with GPI 4.0, using PCR Template for GPI 4.0.
- Update of the conditions for verifying the validity of the EPD.
- Inclusion in Section 4.2 of shelf life of the product, which shall be declared as product information.
- Change in the statement of results: for the upstream processes the results shall be divided between the agricultural and packaging phase, while for the downstream processes between distribution and end of life.
- Inclusion in Section 5.4.3 of the possibility of include additional product information.
- Inclusion in Section 5.4.5.4 of the possibility to include an additional indicator (WEF).
- Minor editorial changes.

PREPARED AND PRESERVED VEGETABLE AND FRUIT PRODUCTS, INCLUDING JUICE
PRODUCT CATEGORY CLASSIFICATION: UN CPC 213, 214