PRODUCT CATEGORY RULES (PCR)
DATE 2023-06-19

CRUDE PETROLEUM AND NATURAL GAS

PRODUCT CATEGORY CLASSIFICATION: UN CPC 120

2023:05
VERSION 1.0, 2023-06-19

VALID UNTIL 2027-06-19

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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 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.

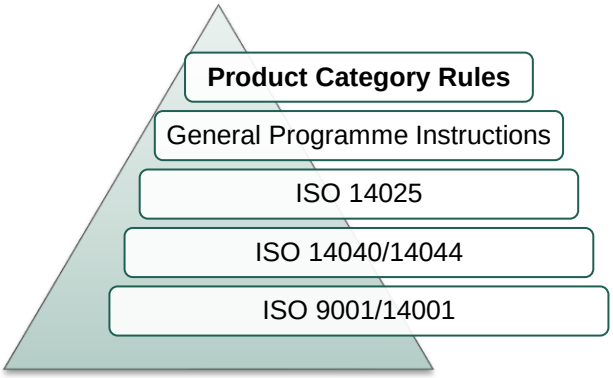

Figure 1 The hierarchy between PCRs, standards and other documents. EN 15804 and ISO 21930 are normative standards for construction products only.

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:	Crude Petroleum and Natural Gas
Registration number and version:	2023:05, Version 1.0
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:	Jessica Hanafi, Life Cycle Indonesia, jessica.hanafi@lifecycleindonesia.com
PCR Committee:	Indonesia Petroleum Association (IPA), Life Cycle Indonesia
Date of publication and last revision:	2023-06-19 (Version 1.0)
Valid until:	2027-06-19
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 and documents conformance:	General Programme Instructions of the International EPD® System, version 4.0, based on ISO 14025 and ISO 14040/14044
PCR language(s):	At the time of publication, this PCR was available in English, with a Bahasa Indonesia version set to be released soon. 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 crude petroleum and natural gas corresponding to UN CPC Division 12 Crude Petroleum and Natural Gas and the declaration of this performance by an EPD. The product category corresponds to UN CPC Division 12 Crude petroleum and natural gas.

- Group 120 Crude petroleum and natural gas

Class 1201	12010	Petroleum oils and oils obtained from bituminous minerals, crude
Class 1202	12020	Natural gas, liquefied or in the gaseous state
Class 1203	12030	Bituminous or oil shale and tar sands

The PCR is valid for systems producing natural gas, crude oil, as well as combined natural gas-crude oil production system.

Note that in this PCR, products of refinery processes such as the following products groups are excluded:

- Divison 33: Coke oven products; refined petroleum products; nuclear fuel

- Product of refinery oil

- Product of gas condensation.

The product group and CPC code shall be specified in the EPD. Additional information regarding CPC codes are available at https://unstats.un.org/unsd/classifications/Family/Detail/1074

2.2.2 GEOGRAPHICAL SCOPE

This PCR may be used globally. The data for the core module shall be representative for the site/region where the respective process is taking place.

2.2.3 EPD VALIDITY

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

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

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

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

3 PCR REVIEW AND BACKGROUND INFORMATION

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

3.1 OPEN CONSULTATION

3.1.1 VERSION 1.0

This PCR was available for open consultation from 2021-12-13 until 2022-02-13, 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.

List of stakeholder names and affiliation:

- Aditya Prana, Chung Yuan Christian University
- Chris Foster, EuGeos Limited
- Directorate General of Oil and Gas. Ministry of Energy and Mineral Resource Republic of Indonesia.
- Nasser Ayoub, EPD Egypt.
- Edi Iswanto Wiloso, Research Center for Sustainable Production System and Life Cycle Assessment, National Research and Innovation Agency (BRIN), Indonesia.
- Ellyna Chairani, Indonesian Association of Life Cycle Assessment and Sustainability Professionals (ProLCAS).
- Niels Jungbluth, ESU-services Ltd
- Oliver Schuler, Sphera
- Paisan Lorpongpaiboon, Asean Vinyl Council
- Widodo Wahyu Purwanto, Chemical Engineering Department, Universitas Indonesia

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:	Claudia A. Peña
Review dates:	2022-08-29 until 2022-11-28

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.
- EPD Norge
- AENOR Global EPD
- Product Environmental Footprint (PEF) http://ec.europa.eu/environment/eussd/smgp/PEFCR_OEFSR_en.htm#final
- No PCRs covering all types of crude petroleum and natural gas were identified.

Error! Reference source not found. lists the identified PCRs and other standardized methods.

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 and ISO 14046. The PCR enables different practitioners to generate consistent results when assessing the environmental impact of products of the same product category, and thereby it supports comparability of products within a product category.

3.5 UNDERLYING STUDIES USED FOR PCR DEVELOPMENT

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

- Kartikasari, Gloria FJ, Rizqi I. Nugroho, Jessica Hanafi, Widodo W. Purwanto, Chandra Sunaryo et al. (2021), Life Cycle Assessment Report on crude oil and natural gas production of PT Pertamina EP Asset 5 for PROPER Environmental Rating, UPPM Chemical Engineering Department, Faculty of Engineering University of Indonesia and PT Life Cycle Cycle Indonesia commissioned by PT Pertamina EP Asset 5, Balikpapan, Indonesia.
- Kartikasari, Gloria FJ, Rizqi I. Nugroho, Jessica Hanafi, Ahyat Muhinsyah et al. (2020), Life Cycle Assessment Report on crude oil and natural gas production of PT Pertamina Hulu Mahakam for PROPER Environmental Rating. PT Life Cycle Indonesia commissioned by PT Pertamina Hulu Mahakam, Balikpapan, Indonesia.
- Kartikasari, Gloria FJ, Rizqi I. Nugroho, Jessica Hanafi, Yuanda, T. Reiza et al. (2022), Life Cycle Assessment Report on crude oil and natural gas production of PT Pertamina Hulu Mahakam for PROPER Environmental Rating. PT Life Cycle Indonesia commissioned by PT Pertamina Hulu Mahakam, Balikpapan, Indonesia.
- Christoph Meili, Niels Jungbluth, Maresa Bussa (2021) Life cycle inventories of crude oil and natural gas extraction. ESU-services Ltd. commissioned by BAFU & VSG, Schaffhausen, Switzerland.

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/FUNCTIONAL UNIT

The declared unit of product shall be defined as 1 MJ of product.

The reference flow in the LCA shall be defined at the customer transfer point, i.e. any losses occurring before then must be taken into account.

The reference flow of tonnes of oil equivalent (TOE) for both oil and natural gas equivalence to MJ as energy content shall be provided. Information on the conversion factor of barrel of oil or MMSCF of gas to TOE should be provided.

This PCR uses a declared unit of MJ as the unit to measure the amount of energy contained in fossil fuel, regardless of its potential applications in various end products, whether it is used as source of energy or feedstock to other products.

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

Crude oil may have completely different characteristics, e.g., density, viscosity, sulphur content (API grade), etc. Technical specifications of crude petroleum or natural gas, such as density and net calorific value, shall be documented. In the production of liquefied natural gas (LNG), the technical parameters, such as CO_2 content of purified gas or average ambient temperature shall be documented.

The type of production technologies should be documented, e.g.:

- Secondary production technologies, i.e. water injection.
- Tertiary production technologies (EOR), e.g. steam, N2, CO2 injection.
- Unconventional production, such as shale gas and tar sands (e.g. open pit, in-situ).

4.3 SYSTEM BOUNDARY

The International EPD® System uses an approach where all attributional processes from “cradle to grave” should be included using the principle of “limited loss of information at the final product”. This is especially important in the case of business-to-consumer communication.

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

For intermediate products or other products for which further processing and/or the end use is unknown, end-of-life treatment of the product may be excluded and the system boundary may be limited to “cradle to gate”if all of the following criteria are fulfilled:

- the product is physically integrated with other products in subsequent life-cycle process (e.g. integrated into petrochemical or refined petroleum products) so they cannot be physically separated from them at end of life,
- the product or material is no longer identifiable at end-of-life as a result of a physical or chemical transformation process,
- the product or material does not contain biogenic carbon, and
- the EPD shall not be used for business-to-consumer communication.

Natural gas is often combusted as energy source and used as a feedstock to petrochemical products. In the case where natural gas is combusted, whether in power plants, as industrial heating or for own use, the system boundary shall be cradle to grave. When the natural gas or crude petroleum is used as a feedstock to petrochemical products or refined products (i.e. serves as intermediate product), then the system boundary may be limited to cradle to gate.

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.

The term upstream, core and downstream processes should not be misinterpreted with the term of upstream, midstream (refining) and downstream (chemical processing) commonly used in the oil and gas industries.

4.3.1.1. Upstream processes

The upstream module comprises cradle-to-gate environmental information on the hydrocarbon production, which consists of drilling and well maintenance operation, and transportation of materials and auxiliary substances necessary for the production.

The following attributional processes are part of the product system and classified as upstream processes: (CPC 120)

- Land use change and occupation for on-shore facilities,
- Well drilling and well installation process,
- Production of materials and infrastructures for drillings. Materials may include mud, chemicals, lubricants and others, while infrastructure may include casing, tubing, and others,
- Well maintenance operations, such as artificial lift, well-head compressor and workover, if available,
- Production of infrastructure and materials for well operations, such as chemicals, lubricants, and explosives,
- Transportation of materials for well drilling and well operations from suppliers to the site,
- Impacts due to the production of electricity, fuels, and transportation used in the upstream module,
- Production and transportation of materials for core process,
- Flaring, venting, and leakages such as fugitive emissions, if available,
- All emissions to air, water and soil due to well drilling, well installation and well maintenance operation, and
- Infrastructure may be excluded. Infrastructure shall be included for studies comparing with other energy sources (renewable and non-renewable).

Upstream processes not listed may also be included. The handling/treatment/transportation of operational waste and residues generated from the upstream processes, e.g., well drilling and well maintenance operations, is included according to the polluter pays principle.

Upstream processes exclude seismic exploration, exploratory drilling and field appraisal phase activities.

All elementary flows at resource extraction shall be included, except for the flows that fall under the general 1% cut-off rule described in Section 4.5. Any exclusion of life cycle stages and unit processes shall be justified.

4.3.1.2. Core processes

The core processes consist of core operation. Core operation comprises gate-to-gate environmental information on the operation stage of crude oil/natural gas separation and gathering process until the delivery point to the distribution system or customer transfer point. The handling/treatment/transportation of operational waste and residues is included according to the polluter pays principle.

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

- Transport from upstream to core process: flow lines, trunk lines, manifold, long distance pipeline transport,
- Gas processing, may include but not limited to sulphur recovery unit, acid gas removal, if available,
- Processing of natural gas into Natural Gas Liquids (NGL), if available,
- Oil processing, may include but not limited to impurities, mercury or acid removal, if available,
- Water and oil separation,
- Gas, oil and water storage, if available,
- Utilities for processes, such as electricity generation, instrument air, water and wastewater treatment, including wastewater treatment for unconventional production, e.g. shale gas, if available,
- Other waste treatment of waste generated in core processes,
- All emissions to air, water and soil including intended (flaring, venting, if any) and unintended (leakage, fugitive) emissions of natural gas, also these resulting from geological structures, e.g. produced water, formation water, naturally occurring radioactive material (NORM) etc.,
- Oil emissions from accidents (pipeline ruptures, blow-outs),
- Ozone depleting substances from fire protection devices, if available, and
- Transports, food and accommodation of personal to extraction sites (helicopter flights, shuttle bus, etc.) if daily commuting to home is not possible.

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

The technical system shall not include:

- Manufacturing of production equipment, buildings and other capital goods,
- Business travel of personnel,
- Travel to and from work by personnel,
- Research and development activities, and
- Accommodation and utilities for personnel.

Any exclusion of life cycle stages and unit processes shall be justified.

For modelling of infrastructure and capital goods, see Section 4.3.2.

4.3.1.3. Downstream processes

The downstream processes of crude petroleum and natural gas as intermediate product comprise of distribution of the products to the customer transfer point or custody transfer point (cradle to gate). The following attributional processes are part of the product system and classified as downstream processes for intermediate product:

- Transportation from preparation to an average retailer/distribution platform or customer/custody transfer point such as pipelines, barge and trucking,
- Emissions from transportation process, such as venting (if any), leakages (fugitive emissions), boil-off rates of LNG tanker transport, and
- Receiving facilities, if available.

The downstream processes of natural gas used as fuel application comprise of distribution or transmission of the product to further processing or direct usage, such as own-use electricity generation and/or heating applications, power plants, residential applications. The following attributional processes for the downstream processes shall be considered:

- Transmission pipeline network to transfer natural gas to industrial customers (high pressure pipeline)
- Distribution pipeline network to transfer natural gas to households (low pressure pipeline).
- Processing of natural gas into liquefied natural gas (LNG)

- Combustion of natural gas or LNG as fuel for applications (e.g., power plants, own-use electricity generation and/or heating applications, and/or residential applications)

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 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 leave nature and enter the technical system (i.e. the product system). Emissions cross the system boundary to nature when they are emitted to air, soil or water.

In the process of crude oil extraction, the boundary between nature and technosphere becomes indistinct. This boundary is further specified to clarify this issue, such as:

- Re-injection of water or gas into the underground (e.g., well injection with water/gas) can be defined as recirculating the water/gas into the system as it is usually used to pushed hydrocarbon out of the well (production), and thus it is not considered as emission,
- The infrastructure materials (e.g., concrete, steels) that are left in the soil (e.g., drill bit, casing, tubing) after full use of the reserve, or the lifetime of the material itself prior to degradation, are considered as emissions to soil,
- Methane emissions can be produced from geological infrastructures due to extraction activities, despite most drilling processes being controlled operation where gas leakage is unfavourable due to safety reason (e.g., can cause a blow-out).

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.

[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 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.

See Section 4.6 for further guidance.

4.3.3.3. Temporal boundary

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

4.3.3.4. Geographical boundary

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

4.4 SYSTEM DIAGRAM

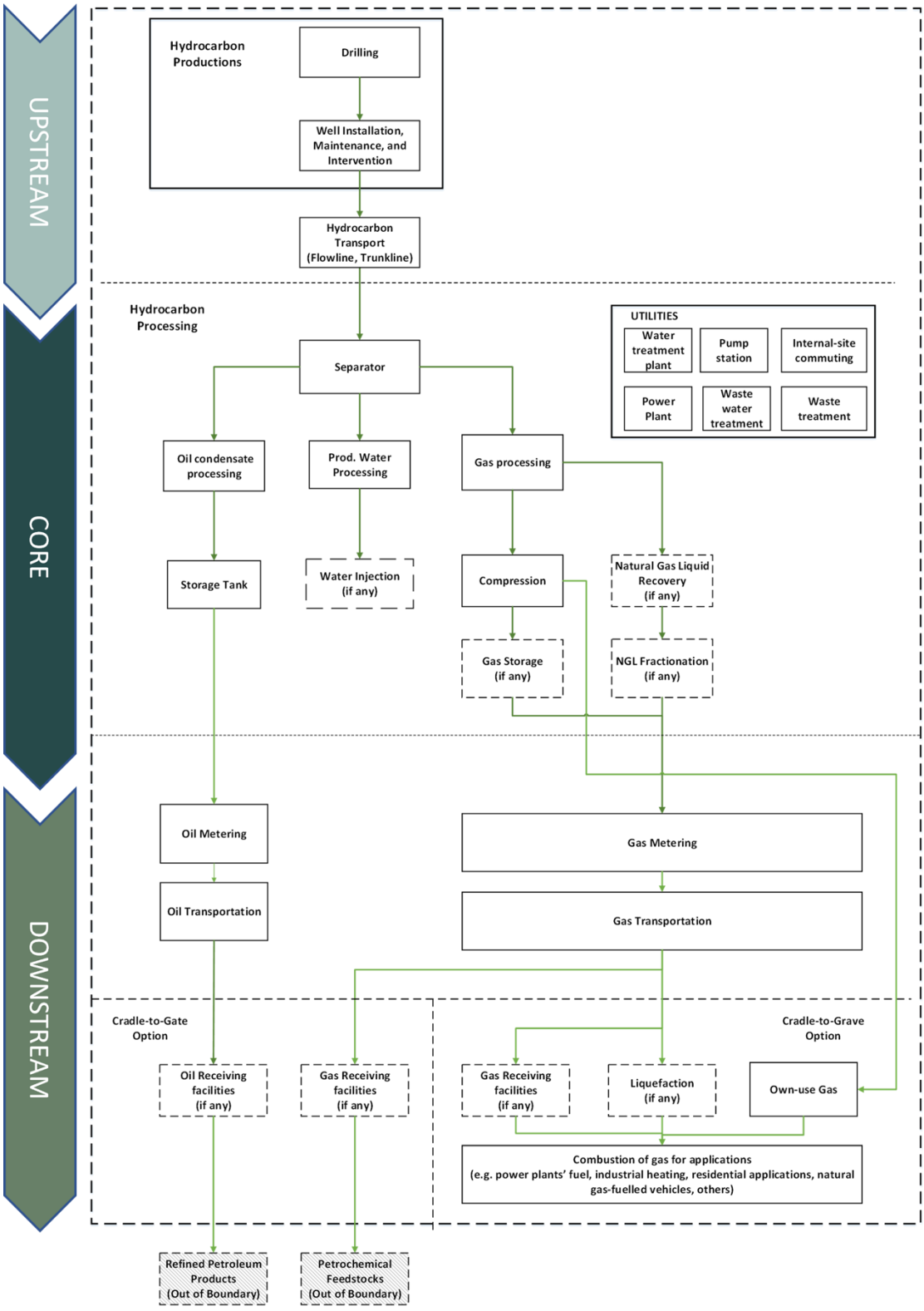

Figure 2 System diagram illustrating the processes that are included in the product system, divided into upstream, core and downstream processes. Depending on the circumstances of each entity, certain processes might not be available and thus can be omitted. It should be indicated if any omissions of life cycle stages or processes are made in order to make the EPD® cover the cradle-to-gate perspective.

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.

Activities in oil and gas upstream sector, particularly in the drilling, well services, and well intervention, have high degree of uncertainties. The exact amount of material consumed within the corresponding processes may not always be well documented. However, since the upstream oil and gas industry is a highly regulated sector in most countries around the world, the procurement data is often available and therefore, can be used for the assessment.

All GHG emissions shall be included, even falling below the 1% cut-off, due to the high relevance of its impacts, even released in small weight quantities as Methane is a GWP potent substance and small amounts of leakages (such as fugitive emissions) may have a relevant impact in terms of GHG emissions.

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

4.6 ALLOCATION RULES

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

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

4.6.1 CO-PRODUCT ALLOCATION

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

1. Allocation shall be avoided, if possible, by dividing the process to be allocated into sub-processes and collecting the inventory data for each sub-process.
2. If allocation cannot be avoided, the inventory data should be partitioned between the different co-products in a way that reflects the underlying physical relationships between them, i.e., allocation should reflect the way in which the inventory data changes if the quantities of delivered co-products change. In the case of oil and gas upstream sector, the best practice for the allocation procedure is allocation based on the energy content"
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
Oil and gas extraction	Oil and gas	Allocation based on the energy content
Product Separation	Crude oil, Natural Gas, Natural Gas Liquid	Allocation based on the energy content
Product Separation	Crude oil, Natural Gas, Natural Gas Liquid and CO2 (from Enhanced Oil Recovery Process) or Sulphur (from gas processing unit)	When CO_2 is produced in as a co-product in Enhanced Oil Recovery process or Sulphur from gas processing unit, economic allocation may be used.

Table 1 Allocation method for key processes in the product system.

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.

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 all 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, where the market value of the waste always is positive, in which the end-of-waste stage is reached when the waste has its lowest market value. Common cases of allocation of waste treatment processes are described below.

For waste being recycled or reused, the environmental impact of processes until the end-of-waste state shall be attributed to the product system generating the waste. Processes after the end-of-waste state, if any, shall be attributed to the product system using the recycled/reused material flow (recycled materials are thereafter considered secondary materials). Internal scraps that are recycled within a manufacturing process shall not be considered as an input of secondary material.

For waste incineration with energy recovery, the end-of-waste state is reached *after* the incineration if the waste incinerator gets paid for incinerating the material (i.e., the material has a negative economic value), which means that the environmental impact of collection, pre-processing and incineration of the waste shall be attributed to the product system generating the waste. Impacts related to making use of the energy, if any, shall however be attributed to the product system using the energy. If the end-of-waste state is reached *before* the incineration/combustion of the waste, the waste shall be considered a secondary fuel and further processing and incineration/combustion of the secondary fuel shall be attributed to the product system using the energy. For example, this is the case if the waste incinerator pays for the material (i.e., the economic value of the material is positive) and all other criteria for the end-of-waste state are fulfilled as well.

For waste incineration without energy recovery, the environmental impact of collection, pre-processing and incineration of the waste shall be attributed to the product system generating the waste.

For landfilling of waste, the environmental impact of landfilling as well as capturing and combustion of landfill gas, if any, shall be attributed to the product system generating the waste. Impacts related to making use of the energy, if any, shall be attributed to the product system using the energy.

Even if benefits of reuse, recycling or recovery by default should be considered to be outside the system boundary (unless an exception is allowed by the PCR, see Section A.3.1), quantitative information on recovered material/energy that potentially can lead to environmental benefits may be declared separately as additional environmental information.

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.
- Specific data shall be conducted through measurement (direct and indirect):
  1. **Direct measurement**, - such as raw materials consumption (Extracted oil and gas, produced water), chemicals, energy (electricity/fuel consumption), muds/mud materials, water use, hazardous and non-hazardous wastes (incl. sludges), air emissions, discharged wastewater (emission to water), flaring, venting (if any)
  2. **Indirect measurement**, - should consists of calculation based on data from the field, such as:
     - land use/land transformation,
     - consumption infrastructures (based on the materials and weight/volume of the infrastructures),
     - energy consumption and emission of equipment (e.g. based on specific equipment rating),
     - fugitive emissions (based on rule of thumbs or other preferred references, e.g. IEA Methane Tracker, Jungbluth et al. (2018), Meili et al. (2018)),
     - other emission not measured (based on emission factors),
     - distance of transportation of goods/chemicals,
     - For long term assets (e.g., land, pipeline), calculation shall also consider the amount of materials (i.e. metal, concretes) and lifetime of the material used throughout the production period (discounted by the estimated ultimate recovery rate/EUR). Example: Pipeline made of steel with a lifetime of 20 years and weigh of 200 kg is used to deliver oil with production volume of 200 bbl per year. The amount of pipeline to make 1 bbl of oil is then (200 kg / (20 years x 200 bbl)).

- 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). This includes:
    - Material production for auxiliaries (e.g., chemicals), material production for infrastructure (e.g., material for pipes), mode of transport, emission from transport
  - 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.

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 of the GPI) shall be met on the level of the product system,
- datasets shall represent average values for a specific reference year; however, how data are generated could vary, e.g. over time, and then they should have the form of a representative annual average value for a specified reference period (such deviations shall be justified and declared in the EPD), and
- the representativeness of the data shall be assessed to be better than ±5%, in terms of the environmental impact calculated on the basis of the data, of data that is fully representative for the given temporal, technological and geographical context.

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

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

4.7.2 EXAMPLES OF DATABASES FOR GENERIC DATA

No recommendations of specific databases for generic data are made.

All commercial or publicly available databases that meet the data quality requirements may be used. The specifications and the version of the database shall be reported in the EPD. The EPD may include a data quality declaration to demonstrate how large share of the impact assessment results that specific data, selected generic data and proxy data contributes to, respectively.

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 upstream in a supply chain over which the EPD owner has direct management control shall be specific and collected on site.
- Data referring to processes of a supplier of main parts, packaging, or main auxiliaries should be requested from the supplier 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[3].
    4. Electricity consumption mix on the market[4].

  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 production of consumer packaging, if the production is under the direct control of the EPD owner or if the environmental impact of the production is more than 10% of the declared results in any of the environmental performance indicators. In other cases, generic data may be used. When consumer packaging shows the

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

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

organization's logo, the LCA report should report the exerted/non-exerted direct control on the production of consumer packaging by the organization.

- The used production technologies should be documented e.g., especially when using non-specific (generic/literature) data. For instance:
  - secondary production technologies, i.e., water injection
  - tertiary production technologies (Enhanced Oil Recovery/EOR), e.g. steam, N_2, CO_2 injection.
  - unconventional production, such as shale gas and tar sands (e.g. open pit, in-situ)
- Calculation considering the lifetime of the material or production volume throughout the life of the material/infrastructure shall be conducted:
  - Land use and land transformation. Data of the actual land use and land transformation should be measured. Example: well area and gathering station area for on-shore or platform area for off-shore.
  - Pipes (including flow lines and trunk lines), and other infrastructures. Pipes or other infrastructure shall be considered. The calculation of the pipelines may based on the weight of the material divided by the expected production capacity throughout the lifetime of the pipe. The lifetime of the pipeline can be estimated from the average lifetime that is normally used in the oil and gas industry. Example: see 4.7. indirect measurement.
  - The lifetime of the land use and land transformation can be estimated from the start of the field development until the end of the company's development contract, and by considering the production capacity throughout the lifetime of the development.

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
- 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[5].
  4. Electricity consumption mix on the market[6]. This option shall not be used for electricity used in processes over which the manufacturer (EPD owner) has direct control, as long as the composition of the residual grid mix has been publicly disclosed[7].

  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.

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

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

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

"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.

Calculation considering the lifetime of the material or production volume throughout the life of the material/infrastructure shall be conducted:

- Land use and land transformation. Data of the actual land use and land transformation should be measured. Example: well area and gathering station area for on-shore or platform area for off-shore.

- Pipes (including flow lines and trunk lines), and other infrastructures. Pipes or other infrastructure can be calculated based on the weight of the material divided by the expected production capacity throughout the lifetime of the pipes. Example: See 4.7, indirect measurements.

4.7.3.3. Downstream processes

The transport of the product to the custody meter / receiving facilities shall be described in the EPD, where relevant, and be accounted for in this priority:

1. Actual transportation modes and distances to the custody meter/receiving facilities, representing the geographical scope of the EPD.
2. A weighted average of transportation modes and distances, based on transportation to custody meters/receiving facilities of several oil and gas producers/companies, representing the geographical scope of the EPD.

When transportation is in the form of pipelines, calculation method should follow the rules for calculating pipelines (Section 4.7 Indirect measurement).

When including the downstream process of natural gas (e.g., combustion of natural gas in power plants, heating applications, residential applications, and natural gas - fueled vehicles):

- Generic data may be used, if the downstream processes are beyond the control of the organization (e.g. third party power plant operators).
- Specific data shall be used, if the processes are within the control of the organization.

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 (http://www.environdec.com/impact-categories/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. Also other indicators may be declared, if justified, see Section 5.4.5.

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

Apart from inventory indicators (such as the required and optional inventory indicators listed at www.environdec.com/indicators), other inventory data may also be declared in the EPD, if relevant and useful for EPD users. Such data shall not be declared in the main body of the EPD, but in an annex. For EPDs published from Indonesia, a list of additional impact categories is available in Annex B.

The source and version of the characterisation models and the factors used shall be reported in the EPD. Alternative regional life cycle impact assessment methods and characterisation factors are allowed to 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.

In addition, water scarcity is a significant issue in the countries that produce oil and gas and thus is a mandatory category to be assessed. In regard to water deprivation potential or water scarcity footprint (ISO 14046), extraction of fossil water and re-injection of water has quite some implications for the water balancing. Extraction of fossil water and emission to surface water can give very positive results in water scarce countries. Therefore, information where the emission of fossil water to the surface water provides a positive results shall be provided.

4.9 INCLUDING MULTIPLE PRODUCTS IN THE SAME EPD

4.9.1 MULTIPLE PRODUCTS FROM THE SAME COMPANY

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

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

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

The option chosen shall be clearly described in the EPD.

4.9.2 SECTOR EPDS

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

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

The following information shall also be included 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[8].

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

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

5.1 EPD LANGUAGES

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

5.2 UNITS AND QUANTITIES

The following requirements apply for units and quantities:

- The International System of Units (SI units) shall be used where available, e.g., kilograms (kg), Joules (J) and metres (m). Reasonable multiples of SI units may be decided in the PCR to improve readability, e.g., grams (g) or megajoules (MJ). The following exceptions apply:
  - Resources used for energy input (primary energy) should be expressed as kilowatt-hours (kWh) or megajoules (MJ), including renewable energy sources, e.g., hydropower, wind power and geothermal power.
  - Water use should be expressed in cubic metres (m^3)
  - Temperature should be expressed in degrees Celsius (°C),
  - Time should be expressed in the units most practical, e.g., seconds, minutes, hours, days or years.
  - Results of the environmental performance indicators shall be expressed in the units prescribed by the impact assessment methods, e.g. kg CO_2 equivalents.
- Three significant figures[9] should be adopted for all results. The number of significant digits shall be appropriate and consistent.
- Scientific notation may be used, e.g. 1.2E+2 for 120, or 1.2E-2 for 0.012.
- The thousand separator and decimal mark in the EPD shall follow one of the following styles (a number with six significant figures shown for illustration):
  - SI style (French version): 1 234,56
  - SI style (English version): 1 234.56

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

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

[9] 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 $1.2*10^{-2}$.

- 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.[10]
  - 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
- EPD registration number as issued by the programme operator[11]
- Date of publication (issue): 20XX-YY-ZZ

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

[11] 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.

- 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 declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison."*
- A statement that the EPD owner has the sole ownership, liability and responsibility of the EPD
- Information about verification[12] and the PCR in a table with the following format and contents:

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

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

Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☐ EPD verification by individual verifier Third-party verifier: *<name, organisation, and signature of the third-party verifier>* Approved by: The International EPD® System
OR
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☐ EPD verification by accredited certification body Third-party verification: *<name, organisation>* is an approved certification body accountable for the third-party verification The certification body is accredited by: *<name of accreditation body & accreditation number, where applicable>*
OR
Independent third-party verification of the declaration and data, according to ISO 14025:2006 via: ☐ EPD verification by EPD Process Certification* Internal auditor: *<name, organisation>* Third-party verification: *<name, organisation>* is an approved certification body accountable for third-party verification Third-party verifier is accredited by: *<name of accreditation body & accreditation number, where applicable>* *For EPD Process Certification, an accredited certification body certifies and reviews the management process and verifies EPDs published on a regular basis. For details about third-party verification procedure of the EPDs, see GPI v4, Section 7.5.
Procedure for follow-up of data during EPD validity involves third-party verifier[13]: ☐ Yes ☐ No

5.4.3 PRODUCT INFORMATION

The product information section of the EPD shall include:

- address and contact information of the 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,

[13] Procedure for follow-up the validity of the EPD is at minimum required once a year with the aim of confirming whether the information in the EPD remains valid or if the EPD needs to be updated during its validity period (see Sections 7.3.2 and 7.4.9 of the GPI). The follow-up can be organized entirely by the EPD owner or together with the original verifier via an agreement between the two parties. In both approaches, the EPD owner is responsible for the procedure being carried out. If a change that requires an update (see Section 6.5 of the GPI) is identified, the EPD shall be re-verified by a verifier.

- 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
- 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),[14] issued by the United Nations or national or regional applications of the GHS. As an example, the following regulations should be used for EPDs intended to be used in the European Union:

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

5.4.5 ENVIRONMENTAL PERFORMANCE

Below subsections list the mandatory environmental performance indicators to declare in the EPD. LCA results based on additional indicators may be declared, if they are relevant for the product category, their inclusion is justified in the EPD, appropriate methods[15] are used, and the results are verifiable. If the additional indicators appear to the reader to display duplicate information, the EPD shall contain an explanation of the differences between the declared indicators.

5.4.5.1. Environmental impacts

The EPD shall declare the environmental impact indicators, per declared unit, per life-cycle stage and in aggregated form, using the default impact categories, impact assessments methods and characterisation factors available 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 differences between the declared sets of indicators, as they may appear to the reader to display duplicate information.

5.4.5.2. Use of resources

The EPD shall declare the mandatory, and may declare the optional, indicators for resource use listed 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 may declare the optional 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

An EPD may declare additional environmentally relevant information, in addition to the LCA results of the section on environmental performance results. The additional environmental information may cover various aspects of specific relevance for the product, for example:

- the release of dangerous substances into indoor air, soil, and water during the use stage,
- 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,

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

[15] If any of the following impact categories are declared in the EPD, the corresponding characterisation methods listed in EN 15804 should be used: particulate matter emissions, ionizing radiation (human health), eco-toxicity (freshwater), human toxicity (cancer effects), human toxicity (non-cancer effects) and land use related impacts/soil quality. If these impact categories and characterisation methods are used, the corresponding disclaimers listed in EN 15804 shall be declared in the EPD.

- 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 (see next bullet point).
- The additional environmental information may include information on permanent (more than 100 years) storage of biogenic carbon, either in the product, in a landfill, or as a consequence of applying carbon capture and storage (CCS) to the incineration of biogenic carbon, and how this would influence GWP-biogenic results if the GWP-biogenic indicator would allow consideration of such storage.

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.

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

CO_2	Carbon dioxide
CPC	Central product classification
EPD	Environmental product declaration
GPI	General Programme Instructions
ISO	International Organization for Standardization
kg	kilogram
LCA	Life cycle assessment
LCI	Life cycle inventory
PCR	Product Category Rules
SI	The International System of Units
SO2	Sulphur dioxide
UN	United Nations
EOR	Enhanced Oil Recovery
REACH	Registration, Evaluation, Authorisation, and Restriction of Chemicals
EUR	estimated ultimate recovery rate
CTUe	Comparative Toxic Unit (h – human, e – ecotoxicity)
Bbl	barrel

7 REFERENCES

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

Guidance for Product Category Rule Development (2013), Ingwersen, W., Subramanian, V., editors. Product Category Rule Guidance Development Initiative. Version 1.0. http://www.pcrguidance.org

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

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

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

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

ISO (2018), ISO/TS 14067:2018, Greenhouse gases – Carbon footprint of products – Requirements and guidelines for quantification and communication

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

8 VERSION HISTORY OF PCR

VERSION 1.0, 2023-06-19

Original version of the PCR

CRUDE PETROLEUM AND NATURAL GAS
PRODUCT CATEGORY CLASSIFICATION: UN CPC 120