

THE INTERNATIONAL EPD® SYSTEM



**PCR BASIC MODULE**

CPC Division 47

RADIO; TELEVISION AND COMMUNICATION EQUIPMENT AND  
APPARATUS

VERSION 0.5 DATED 2009-08-11

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## HOW TO USE PCR BASIC MODULES BASED ON THE UN CPC STRUCTURE

CPC is a complete product classification scheme covering goods and services. It is based on the physical characteristics of goods or on the nature of the services rendered. Each type of good or service distinguished in the CPC is defined in such a way that it is normally produced by only one activity as defined in the International Standard Industrial Classification of all economic activities (ISIC Rev. 4). This PCR basic module is based on CPC ver. 2.0, for more information see <http://unstats.un.org/unsd/cr/registry>.

The use of the CPC system leads to a structure for PCR documents in two dimensions:

- a “horizontal” dimension describing the product’s value chain divided according to business sectors, i.e. building on CPC-coded information modules, and
- a “vertical” dimension defining each information module (with a further delineation of each such section into subclasses).

The CPC concept forms the basis for a PCR structure to:

- provide a structure for industry specific PCR core modules, or rather the PCR core module and up-streams modules as well as down-streams modules within the product group system boundary, and
- open up for differentiated, but defined levels of requirements in the PCR document, i.e. part of the requirements may be applicable on a generic product group level, part of the requirements may be limited to selected individual products.

PCR Basic Modules make use of this option provided by the CPC concept, and are close to ready-made draft PCR documents with some information still lacking, but the lacking information is identified in the document.

The PCR Basic Module document includes:

1. Text which is common for all full PCR documents regardless of product group, e.g. the introduction section
2. Text including requirements which are common for all products which belong to the specified product group on UN CPC code two digit level, e.g. CPC Division 01: Products of agriculture, horticulture and market gardening. PCR requirements valid on two digit level are specified (marked with CPC XX).
3. Identified specific requirements or information, written in *italic*, which must be decided upon on a more detailed level than the CPC Division level. In the final PCR document this detailed level could be anything from CPC three digit level to five digit level dependent on the level of the final PCR document. Thus, the information requested in *italic* shall be replaced by the relevant text, e.g. instead of the text “product group” in the PCR Basic Module document the final PCR document may read “transformers” in a PCR for transformers.

The PCR Basic Module document provides a close to ready-made PCR document. Just decide upon and add the relevant information requested in *italic*.

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## DIVISION 47: RADIO, TELEVISION AND COMMUNICATION EQUIPMENT AND APPARATUS

This Division is divided into the following groups (three digits) and classes (four digits):

- 471 Electronic valves and tubes; electronic components; parts thereof
  - 4711 Electrical capacitors
  - 4712 Electrical resistors (except heating resistors)
  - 4713 Printed circuits
  - 4714 Thermionic, cold cathode or photo-cathode valves and tubes (including cathode ray tubes)
  - 4715 Diodes, transistors and similar semi-conductor devices; photosensitive semi-conductor devices; light emitting diodes; mounted piezo-electric crystals
  - 4716 Electronic integrated circuits
  - 4717 Parts for the goods of classes 4711, 4712 and 4714 to 4716
- 472 Television and radio transmitters; television, video and digital cameras; telephone sets
  - 4721 Transmission apparatus for radio-broadcasting or television, whether or not incorporating reception apparatus or sound recording or reproducing apparatus; television cameras, digital cameras and video camera recorders
  - 4722 Telephone sets, including telephones for cellular networks or for other wireless networks; other apparatus for the transmission or reception of voice, images or other data, including apparatus for communication in a wired or wireless network (such as a local or wide area network)
- 473 Radio broadcast and television receivers; apparatus for sound and video recording and reproducing; microphones, loudspeakers, amplifiers, etc.
  - 4731 Radio broadcast and television receivers
  - 4732 Apparatus for sound and video recording and reproducing
  - 4733 Microphones and stands therefor; loudspeakers; headphones, earphones and combined microphone/speaker sets; audio-frequency electric amplifiers; electric sound amplifier sets
- 474 Parts for the goods of classes 4721 to 4733 and 4822
  - 4740 Parts for the goods of classes 4721 to 4733 and 4822
- 475 Disks, tapes, solid-state non-volatile storage devices and other media, not recorded
  - 4753 Magnetic media, not recorded, except cards with a magnetic stripe
  - 4754 Optical media, not recorded
  - 4755 Solid-state non-volatile storage devices

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- 4759 Other recording media, including matrices and masters for the production of disks
- 476 Audio, video and other disks, tapes and other physical media, recorded
  - 4761 Musical audio disks, tapes or other physical media
  - 4762 Films and other video content on disks, tape or other physical media
  - 4769 Other recorded disks, tapes or other physical media
- 478 Packaged software
  - 4781 Systems software, packaged
  - 4782 Application software, packaged
- 479 Cards with magnetic strips or chip
  - 4791 Cards with a magnetic stripe
  - 4792 "Smart cards"

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***Important!*** PCR requirements valid on level CPC division 47 are specified (marked with CPC 47). Certain requirements are dependent on the choice of specific product group, and need to be defined on lower, more specific levels (Group, Class, or Subclass). These requirements, written in italic, are only identified in general terms in this document. All text written in italic shall be replaced by sharp requirements or deleted as appropriate in the final PCR document.

## GENERAL INTRODUCTION

*(This section shall be included in all PCR- documents)*

The international EPD® system is based on a hierarchic approach following the international standards:

- ISO 9001, Quality management systems
- ISO 14001, Environmental management systems
- ISO 14040, LCA - Principles and procedures
- ISO 14044, LCA - Requirements and guidelines
- ISO 14025, Type III environmental declarations
- ISO 21930, Environmental declaration of building products.

The General Programme Instructions are based on these standards, as well as instructions for developing Product Category Rules (PCR).

The documentation to the International EPD® system includes three separate parts ([www.environdec.com](http://www.environdec.com)):

- Introduction, intended uses and key programme elements
- General Programme Instructions
- Supporting annexes

This PCR-document specifies further and additional minimum requirements on EPDs of the product group defined below complementary to the above mentioned general requirement documents.

Principle programme elements concerning the Product Category Rules (PCR) included in International EPD® system are presented below.

Purpose	Element identification and principal approach
Complying with principles set in ISO 14025 on modularity and comparability	1. "Book-keeping LCA approach" 2. A Polluter-Pays (PP) allocation method
Simplifying work to develop Product Category Rules (PCR)	3. PCR Module Initiative (PMI) in order to structure PCR in modules according to international classification

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	4. PCR moderator for leadership and support of the PCR work
Secure international participation in PCR work	5. Global PCR Forum for open and transparent EPD stakeholder consultation
Facilitating, identification and collection of LCA-based information	6. Selective data quality approach for specific and generic data

Product Category Rules (PCR) are specified for specified information modules “gate-to-gate”, so called core modules. The structure and aggregation level of the core modules is defined by the United Nation Statistics Division - Classification Registry CPC codes (<http://unstats.un.org>). The PCR also provides rules for which methodology and data to use in the full LCA, i.e. life cycle parts up-streams and down-streams the core module. The PCR also has requirements on the information given in the EPD, e.g. additional environmental information. A general requirement on the information in the EPD is that all information given in the EPD, mandatory and voluntary, shall be verifiable.

In the EPD, the environmental performance associated with each of the three life-cycle stages mentioned above are reported separately:

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## 1 GENERAL INFORMATION

*(This section shall after editing be included in all PCR document)*

<b>Date and registration no:</b>	<i>date and registration number of the PCR</i>
<b>This PCR was prepared by:</b>	<i>names of organisations</i>
<b>Appointed PCR moderator:</b>	<i>Name, organisation,, e-mail address</i>
<b>Open consultation period:</b>	<i>date until date.</i>
<b>Valid within the following geographical representativeness:</b>	<i>Describe the geographical representativeness for the PCR.</i>
<b>Valid until:</b>	<i>date</i>

This document provides Product Category Rules (PCR) for the assessment of the environmental performance of *UN CPC 47XXX (define product group)* and the declaration of this performance by an EPD. *(CPC 47)*

This PCR is based on the requirements and guidelines given in “PCR Basic Module, CPC Division 47: “Radio, television and communication equipment and apparatus”, version x.x, dated xxx 2009. *(CPC 47)*

Any comments to this PCR document may be given on the Global PCR Forum or directly to the PCR moderator during the period of validity. *(CPC 47)*

The PCR document is a living document. If relevant changes in the LCA methodology or in the technology for the product category occur, the document will be revised and any changes will be published on the international website: [www.environdec.com](http://www.environdec.com). *(CPC 47)*

The EPD shall refer to a specific PCR version number. The production of new PCR versions does not affect the EPD certification period. *(CPC 47)*

## 2 DEFINITION OF THE PRODUCT GROUP

*The products and services included in the product group shall be described. Examples on services included and not included may be given for assistance to the EPD developer.*

The product group and CPC code shall be specified in the EPD. *(CPC 47)*

### 2.1 SPECIFICATION OF MANUFACTURING COMPANY

*The PCR shall specify the information on the manufacturing/producing company that is required in the EPD, separated into mandatory and voluntary information.*

Example:

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Mandatory information:

- *Company*
- *Production site(s)*
- *Issuer and contacts*

Examples of voluntary information:

- *Information on environmental management system*
- *Specific aspects regarding the production*
- *Environmental policy*
- *Manufacturers logotype*

## 2.2 SPECIFICATION OF THE PRODUCT

The PCR is a template for one of the products in the product group, including e.g. electronic components, television, video, digital cameras; microphones, loudspeakers, disks, cards with magnetic strips or chip.

*Type of product shall be specified at a more detailed CPC level.*

*The PCR shall specify the information on the product required in the EPD.*

## 3 FUNCTIONAL UNIT

The functional unit shall be one product unit (*CPC 47*).

*If not relevant the functional unit shall be defined at a more detailed CPC level.*

## 4 CONTENT OF MATERIALS AND CHEMICAL SUBSTANCES

The gross weight of material shall be declared in the EPD at a minimum of 99,5 % of one product unit (*CPC 47*).

*Deviations from this requirement shall be justified at a more detailed CPC level, which shall be given in the PCR document.*

Content of regulated substances within the geographical regions for which the EPD is valid shall be declared as well as the geographical validity of the EPD. (*CPC 47*)

## 5 UNITS AND QUANTITIES

SI units shall be used preferred power and energy units are: (*CPC 47*)

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- kW (MW) for power
- kWh (MWh) for energy

A maximum of three value numbers shall be used when reporting LCA results. (CPC 47)  
Other units may be regulated on a more detailed CPC level, if relevant.

## 6 GENERAL SYSTEM BOUNDARIES

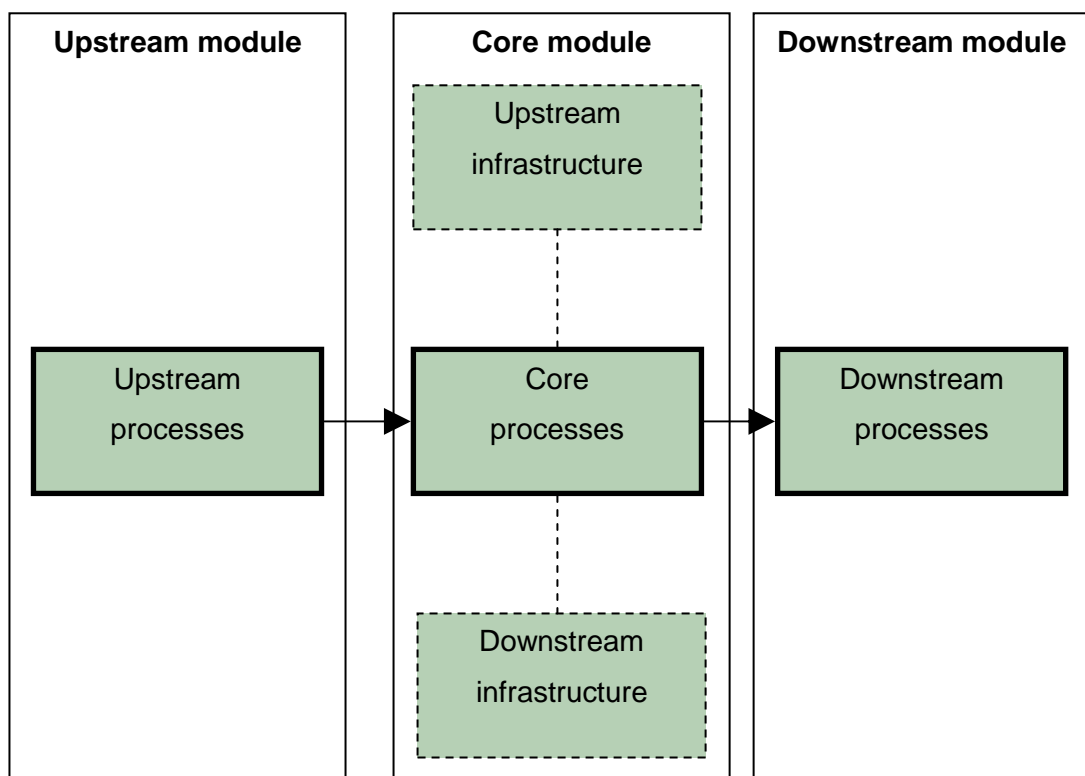


Figure 1. Presentation of Core Module (core process) and upstream and downstream processes. The figure illustrates that all relevant unit processes taking place in the upstream-, core- and downstream processes shall be included. To identify the relevance of including upstream and downstream infrastructure the commonly defined cut-off rules shall be applied

### 6.1 UPSTREAM PROCESSES

The upstream processes include the following inflow of raw materials and energy wares needed for the production of *the product*: (CPC 47)

- extraction and production of raw material for all main parts and components (to be defined at a more detailed CPC level)
- transportation of raw material

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- the production processes of energy wares used in raw material production

## 6.2 CORE PROCESSES

The core process includes: *(CPC 47)*

- manufacturing process for main parts and components according to a further specification below (7.1.1)
- assembly of the final product and/or testing in own establishment, if applicable
- The manufacture of primary and secondary packaging
- treatment of waste generated from the manufacturing of main parts and assembly of the product
- the core process includes external transportation of materials to the factory and internal transportation within the factory.

## 6.3 DOWNSTREAM PROCESSES

The downstream processes include: *(CPC 47)*

- transportation from final manufacturing to customer
- lifetime operation of the product including power losses and emissions
- maintenance, replacements of parts, during life time
- recycling of material after end of life
- recycling or handling of packaging materials after use

In the EPD, the environmental performance associated with each of the three life-cycle stages above reported separately. *(CPC 47)*

# 7 CORE MODULE

## 7.1 SYSTEM BOUNDARIES

### 7.1.1 TECHNICAL SYSTEM

The manufacturing of the parts listed below and the assembly process shall be included. The manufacturing processes for other parts may be included. However, the raw material used for production of other parts shall be included. *(CPC 47)*

Processes for which manufacturing are mandatory to include: *(CPC 47)*

- xxx
- yyyy
- *Etc.*

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A minimum of 99% of the material content of the declared product shall be included. (CPC 47)

Waste that is deposited in landfill shall not be included in the system boundaries, but accounted for as an outflow. (CPC 47)

Waste that is deposited in landfill shall be declared as kg of waste and kg of hazardous waste. (CPC 47)

The manufacturing of production equipment with an expected lifetime over three years, buildings and other capital goods shall not be included. (CPC 47)

Maintenance activities more frequent than every three years shall be included. (CPC 47)

Business travel of personnel may be included. Travel to and from work by personnel should not be included. (CPC 47)

*Research and development activities may be included if relevant. This should be regulated on more detailed CPC levels.*

#### 7.1.2 GEOGRAPHICAL BOUNDARIES

The data for the core module shall be representative for the actual production processes and representative for the site/region where the respective process is taking place. (CPC 47)

#### 7.1.3 TIME BOUNDARIES

The data shall be representative for the year/time frame for which the EPD is valid (maximum three years). (CPC 47)

#### 7.1.4 BOUNDARIES TO NATURE

Boundaries to nature are defined as flows of material and energy resources from nature into the system. Emissions to air, water and soil cross the system boundary when they are emitted from or leaving the product system. (CPC 47)

#### 7.1.5 BOUNDARIES TO OTHER PRODUCT LIFE CYCLES

If there is an inflow of recycled material to the production system in the production/manufacturing phase, the recycling process and the transportation from the recycling process to where the material is used shall be included. If there is an outflow of material to recycling, the transportation of the material to the recycling process shall be included. The material going to recycling is then an outflow from the production system (see supporting annex A). (CPC 47)

### 7.2 CUT OFF RULES

Life Cycle Inventory data for a minimum of 99 % of total inflows to the core module shall be included. Parts and materials not included in the LCA shall be documented in the EPD. (CPC 47)

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### 7.3 ALLOCATION RULES

*Allocation between different products and co-products shall be specified on a more detailed CPC level. The choice of functional unit may provide guidance.*

### 7.4 DATA QUALITY RULES

Specific data (often called site specific data) shall be used for the Core Module. (CPC 47)

Specific data are gathered from the sites where specific processes are carried out. (CPC 47)

The requirement for specific data also include actual product weights, amounts of raw materials used and amounts of waste etc. (CPC 47)

Specific data for the generation of electricity bought shall be used if possible. The data should be verifiable by invoice or similar. (CPC 47)

If specific data are not available or if the electricity bought is not specified for parts of the Core Module, the electricity mix used in those parts shall be approximated as the official electricity mix in the country of manufacture. The mix of energy shall be documented. (CPC 47)

### 7.5 OTHER CALCULATION RULES

*These may be given at a more detailed level, if relevant.*

## 8 UPSTREAM MODULE

### 8.1 SYSTEM BOUNDARIES

All elementary flows at resource extraction shall be included, except for the flows that falls under the general 1% cut off rule. Production of all raw materials shall be included. (CPC 47)

### 8.2 DATA QUALITY RULES

Selected generic data shall be used if specific data are unavailable, e. g. data from commonly available data sources such as commercial databases and free databases, describing specific raw materials or processes usually referring to the system under study or to other systems equivalent from a technical point of view. (CPC 47)

For allowing the use of selected generic data, a number of pre-set characteristics must be fulfilled and demonstrated: (CPC 47)

- *Representativeness of the geographical area* should adhere to “Data deriving from areas with the same legislative framework and the same energetic mix”,
- *Technological equivalence* adhere to “Data deriving from the same chemical and physical processes or at least the same technology coverage (nature of the technology

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mix, e.g. weighted average of the actual process mix, best available technology or worst operating unit)",

- *Boundaries towards nature* adhere to "Data shall report all the quantitative information (resources, solid, liquid, gaseous emissions; etc.) necessary for the EPD", and
- *Boundaries towards technical systems* adhere to "The boundaries of the considered life cycle stage shall be equivalent".

*Recommendations for certain databases for selected generic data which describe material flows connected to a number of input materials may also be used. If recommendations are given to use such selected generic data, such data sources shall be listed in a table in the PCR document.*

### 8.3 RULES FOR GENERIC DATA

If these data sources do not supply the necessary data, other generic data may be used and documented. The environmental impact of the processes where the other generic data are used must not exceed 10% of the overall environmental impact from the product system. (CPC 47)

## 9 DOWNSTREAM MODULE

*Distribution scenarios shall be defined at a more detailed CPC level.*

### 9.1 USE PHASE SCENARIO

*Use phase scenarios shall be defined in PCR for more detailed product CPC levels for product categories where there is an environmental impact from the use phase. Maintenance at use may also be included in the use phase scenarios.*

### 9.2 RECYCLING DECLARATION AND WASTE TREATMENT

*Recommendations for source separation and recycling shall be given, as well as recommendations for other waste treatment of product parts if relevant. The PCR may define after use scenarios for recycling quotas and waste treatment methods. The potential benefit of recycling and waste treatment of the products according to the specified scenarios shall be presented in the EPD.*

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## 10 ENVIRONMENTAL PERFORMANCE RELATED INFORMATION

### 10.1 USE OF RESOURCES

The consumption of natural resources and resources shall be reported in the EPD. (CPC 47)

Input parameters, extracted resources: (CPC 47)

- Non-renewable resources
  - Material resources
  - Energy resources (used for energy conversion purposes)
- Renewable resources
  - Material resources
  - Energy resources (used for energy conversion purposes)
- Water use
- Electricity (electricity consumption during manufacturing and use of goods, or during service provision).

### 10.2 POTENTIAL ENVIRONMENTAL IMPACT

The environmental impact per functional unit for the following environmental impact categories shall be reported in the EPD, divided into core, upstream and, if relevant, downstream module: (CPC 47)

- The emissions of greenhouse gases (expressed in global warming potential, GWP, in 100 year perspective).
- Emission of ozone-depleting gases (expressed as the sum of ozone-depleting potential in CFC 11-equivalents, 20 years).
- Emission of acidification gases (expressed as the sum of acidification potential expresses in SO<sub>2</sub>- equivalents).
- Emissions of gases that contribute to the creation of ground level ozone (expressed as the sum of ozone-creating potential, ethene-equivalents).
- Emission of substances to water contributing to oxygen depletion (expressed as PO<sub>4</sub><sup>3-</sup>-equivalents).

The tables from General Programme Instructions, Annex B shall be used. (CPC 47)

### 10.3 OTHER INDICATORS

The following indicators shall be reported in the EPD, also per functional unit and divided into two or the three modules: (CPC 47)

- Material subject for recycling

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- Hazardous waste, kg (as defined by regional directives)
- Other waste, kg
- Toxic emissions: to be decided in more detailed PCRs

## 10.4 ADDITIONAL ENVIRONMENTAL INFORMATION

*The additional environmental information shall be specified at a more detailed CPC level. , e.g. field of application, impact on health, technical life length, maintenance, the final use of product, fire risks, risks at fire.*

Information about biogenic CO<sub>2</sub> emissions is not necessary. If reported the biogenic CO<sub>2</sub> emissions shall be separated from the other greenhouse gases (expressed in global warming potential, GWP, in 100 year perspective). (CPC 47)

## 11 CONTENT OF THE EPD (CPC 47)

*The requirements in this chapter are mandatory for all PCRs within CPC Division 47.*

### 11.1 PROGRAMME RELATED INFORMATION

The programme related part of the EPD shall include:

- Name of the programme and programme operator
- The reference PCR document
- Registration number
- Date of publication and validity
- Geographical scope of application of EPD
- Information about the year or reference period of the underlying data to the EPD
- Reference to the homepage – [www.environdec.com](http://www.environdec.com) – for more information.

### 11.2 PRODUCT RELATED INFORMATION

#### 11.2.1 SPECIFICATION OF THE PRODUCTION COMPANY

See 2.1.

#### 11.2.2 SPECIFICATION OF THE PRODUCT

See 2.2.

#### 11.2.3 FUNCTIONAL UNIT

See 3.

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#### 11.2.4 CONTENT OF MATERIALS AND CHEMICAL SUBSTANCES

See 4.

#### 11.2.5 COMPARISONS OF EPDS WITHIN THIS PRODUCT CATEGORY

To be able to compare EPDs within this product category, they have to be based on this particular PCR. The user of the EPD information should be made aware of this by the inclusion of this statement in the EPD:

“EPDs from different programmes may not be comparable”

#### 11.2.6 VALIDITY OF THE EPD

The validity of the EPD shall be reported in the EPD.

### 11.3 ENVIRONMENTAL PERFORMANCE-RELATED INFORMATION

#### 11.3.1 ENVIRONMENTAL PERFORMANCE DECLARATION - MINIMUM SET OF PARAMETERS FROM THE LCA STUDY, REPORTED PER FUNCTIONAL UNIT

Upstream module, core module and downstream module shall be reported separately for the resource use, potential environmental impact and other indicators such as waste.

#### 11.3.2 USE OF RESOURCES

In this category the consumption of natural resources and resources per functional unit shall be reported.

See 10.1.

### 11.4 POTENTIAL ENVIRONMENTAL IMPACT

In this category the potential environmental impact per functional unit shall be reported.

See 10.2.

#### 11.4.1 OTHER INDICATORS

In this category relevant indicators shall be reported per functional unit.

See 10.3.

#### 11.4.2 ADDITIONAL ENVIRONMENTAL INFORMATION

See 10.4.

### 11.5 DIFFERENCES VERSUS PREVIOUS VERSIONS OF THE EPD

The main causes for changes in environmental performance in comparison with previous EPD versions shall be described shortly.

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## 11.6 VERIFICATION

The EPD shall give the following information about the verification process:

PCR review conducted by:	<i>Name and organization of the chair, and information on how to contact the chair through the programme operator</i>
Independent verification of the declaration and data, according to ISO 14025:	<i>Internal (EPD process certificate) or external, if external name of the third party verifier</i>
Accredited or approved by (if relevant):	<i>Name of the organisation</i>

## 11.7 REFERENCES

The EPD shall, if relevant, refer to:

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

## 12 VALIDITY OF THE EPD

If changes in any of the environmental impacts are larger than +- 5% the EPD shall be adjusted. Regardless, the EPD shall be reviewed every three years. (CPC 47)

## 13 CHANGES IN THIS DOCUMENT

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