

THE INTERNATIONAL EPD® SYSTEM



**PCR BASIC MODULE**

CPC Division 42

FABRICATED METAL PRODUCTS, EXCEPT MACHINERY AND  
EQUIPMENT

VERSION 0.5 DATED 2009-08-11

DRAFT

How to use PCR Basic Modules based on the UN CPC structure.....	3
Division 42: Fabricated metal products, except machinery and equipment.....	3
General Introduction .....	3
1 General information .....	3
2 Definition of the product group .....	3
3 Functional unit .....	3
4 Content of materials and chemical substances .....	3
5 Units and quantities .....	3
6 General system boundaries .....	3
7 Core Module .....	3
8 Upstream Module.....	3
9 Downstream Module .....	3
10 Environmental performance related information .....	3
11 Content of the EPD (CPC 42).....	3
12 Validity of the EPD .....	3
13 Changes in this document .....	3

**DRAFT**

## 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*.

# DRAFT

## DIVISION 42: FABRICATED METAL PRODUCTS, EXCEPT MACHINERY AND EQUIPMENT

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

- 421 Structural metal products and parts thereof
  - 4211 Bridges, bridge sections, towers and lattice masts, of iron or steel
  - 4212 Doors, windows and their frames and thresholds for doors, of iron, steel or aluminium
  - 4219 Other structures (except prefabricated buildings) and parts of structures, of iron, steel or aluminium; plates, rods, angles, shapes, sections, profiles, tubes and the like, prepared for use in structures, of iron, steel or aluminium; props and similar equipment for scaffolding, shuttering or pitpropping
- 422 Tanks, reservoirs and containers of iron, steel or aluminium
  - 4221 Reservoirs, tanks, vats and similar containers (other than for compressed or liquefied gas), of iron, steel or aluminium, of a capacity exceeding 300 litres, not fitted with mechanical or thermal equipment
  - 4222 Containers for compressed or liquefied gas, of iron, steel or aluminium
- 423 Steam generators, (except central heating boilers) and parts thereof
  - 4231 Nuclear reactors
  - 4232 Steam or other vapour generating boilers (other than central heating hot water boilers capable also of producing low pressure steam); super-heated water boilers
  - 4233 Auxiliary plant for use with boilers; condensers for steam or other vapour power units
  - 4234 Parts for the goods of classes 4231 to 4233
- 429 Other fabricated metal products
  - 4291 Domestic metal products
  - 4292 Hand tools (including hand tools of a kind used in agriculture, horticulture or forestry, hand saws, files, pliers and metal cutting shears, hand-operated spanners, blow-lamps and clamps); interchangeable tools for hand tools or for machine tools, including dies for drawing or extruding metal, and rock drilling or earth boring tools; knives for machines; plates, sticks, tips and the like for tools, unmounted, of sintered metal carbides or cermets
  - 4293 Tanks, casks, drums, cans, boxes and similar containers (other than for compressed or liquefied gas) of iron, steel or aluminium, of a capacity not exceeding 300 litres, not fitted with mechanical or thermal equipment; stoppers, caps and lids (including crown corks), capsules for bottles, threaded bungs, bung covers, seals and other packing accessories, of base

# DRAFT

metal

- 4294 Metal fasteners, springs and miscellaneous articles made from metal wire
- 4295 Wire, rods, tubes, plates, electrodes and similar products, of base metal or of metal carbides, coated or cored with flux material, of a kind used for soldering, brazing, welding or deposition of metal or of metal carbides; wire and rods, of agglomerated base metal powder, used for metal spraying
- 4299 Other metal goods

DRAFT

***Important!*** PCR requirements valid on level CPC division 42 are specified (marked with CPC 42). 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

**DRAFT**

	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:

DRAFT

## 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 42XXX (define product group)* and the declaration of this performance by an EPD. *(CPC 42)*

This PCR is based on the requirements and guidelines given in “PCR Basic Module, CPC Division 42: “Fabricated metal products, except machinery and equipment”, version x.x, dated xxx 2009. *(CPC 42)*

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 42)*

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 42)*

The EPD shall refer to a specific PCR version number. The production of new PCR versions does not affect the EPD certification period. *(CPC 42)*

## 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 42)*

### 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:

**DRAFT**



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. structural metal products, tanks, reservoirs and containers of iron, steel or aluminium, steam generators and other fabricated metal products. 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 42*).

*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 % of one product unit (*CPC 42*).

*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 42*)

## 5 UNITS AND QUANTITIES

SI units shall be used preferred power and energy units are: (*CPC 42*)

**DRAFT**

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

A maximum of three value numbers shall be used when reporting LCA results. (CPC 42)  
Other units may be regulated on a more detailed CPC level, if relevant.

## 6 GENERAL SYSTEM BOUNDARIES

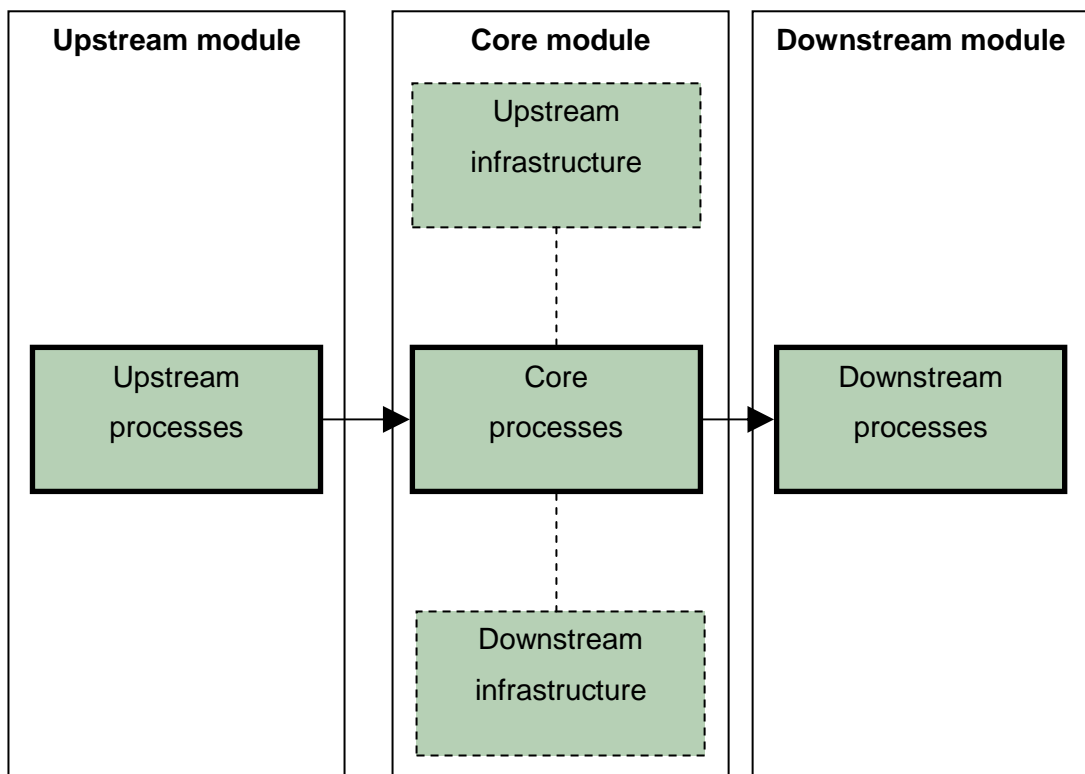


Figure 1. Presentation of Core Module (core process) and upstream and downstream processes. The figure illustrates that all relevant unit processes taking place in the upstream-, core- and downstream processes shall be included. To identify the relevance of including upstream and downstream infrastructure 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 42)

- extraction and production of raw material for all main parts and components (to be defined at a more detailed CPC level)
- if relevant, recycling process of recycled material used in the product

**DRAFT**

- transportation of raw material

## 6.2 CORE PROCESSES

The core process includes: *(CPC 42)*

- manufacturing process for main parts and components according to a further specification below (7.1.1)
- assembly of the final product
- 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 42)*

- 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 42)*

# 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 42)*

Processes for which manufacturing are mandatory to include: *(CPC 42)*

- xxx
- yyyy
- *Etc.*

# DRAFT

A minimum of 99% of the material content of the declared product shall be included. (CPC 42)

Waste that is deposited in landfill shall not be included in the system boundaries, but accounted for as an outflow. (CPC 42)

Waste that is deposited in landfill shall be declared as kg of waste and kg of hazardous waste. (CPC 42)

The manufacturing of production equipment with an expected lifetime over three years, buildings and other capital goods shall not be included. (CPC 42)

Maintenance activities more frequent than every three years shall be included. (CPC 42)

Business travel of personnel may be included. Travel to and from work by personnel should not be included. (CPC 42)

*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 42)

#### 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 42)

#### 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 42)

#### 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 42)

### 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 42)

DRAFT

### 7.3 ALLOCATION RULES

Allocation between different products and co-products shall be based on economic allocation. (CPC 42)

*As an alternative, allocation rules may be given at a more detailed level, given in the PCR document. 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 42)

Specific data are gathered from the sites where specific processes are carried out. (CPC 42)

The requirement for specific data also include actual product weights, amounts of raw materials used and amounts of waste etc. (CPC 42)

Specific data for the generation of electricity bought shall be used if possible. The data should be verifiable by invoice or similar. (CPC 42)

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 42)

### 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 42)

### 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 42)

For allowing the use of selected generic data, a number of pre-set characteristics must be fulfilled and demonstrated: (CPC 42)

- *Representativeness of the geographical area should adhere to "Data deriving from areas with the same legislative framework and the same energetic mix",*

# DRAFT

- *Technological equivalence* adhere to “Data deriving from the same chemical and physical processes or at least the same technology coverage (nature of the technology 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 42)

## 9 DOWNSTREAM MODULE

Distribution scenarios shall be defined at a more detailed CPC level. (CPC 42)

### 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.*

DRAFT

## 10 ENVIRONMENTAL PERFORMANCE RELATED INFORMATION

### 10.1 USE OF RESOURCES

The consumption of natural resources and resources per functional unit shall be reported in the EPD, divided into core, upstream and downstream module. (CPC 42)

Input parameters, extracted resources: (CPC 42)

- 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 42)

- 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 42)

### 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 42)

- Material subject for recycling

**DRAFT**

- 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 42)

## 11 CONTENT OF THE EPD (CPC 42)

*The requirements in this chapter are mandatory for all PCRs within CPC Division 42.*

### 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.

**DRAFT**



#### 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.

**DRAFT**

## 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 42)

## 13 CHANGES IN THIS DOCUMENT

VERSION 0.5, 2009-08-11

Draft version.

**DRAFT**

