PRODUCT CATEGORY RULES
DATE 2013-07-18

UN CPC 6921
WATER DISTRIBUTION THROUGH MAINS (EXCEPT STEAM AND HOT WATER)

2011:12
VERSION 1.01

TABLE OF CONTENT

GENERAL INTRODUCTION

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):

- 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 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.

1 GENERAL INFORMATION

Date:	2013-07-18 (Version 1.0: 2011-09-27)
Registration no:	2011:12
This PCR was prepared by:	ERVET (Emilia-Romagna Development Agency).
Appointed PCR moderator:	Mr. Guido Croce, ERVET, gcroce@ervet.it Mr. Enrico Cancila, ERVET, ecancila@ervet.it
Open consultation period:	2011-02-21 until 2011-04-04
Valid within the following geographical representativeness:	Global
Valid until:	2014-09-27
More information on this PCR's website:	http://environdec.com/en/Product-Category-Rules/Detail/?Pcr=5880

This document provides Product Category Rules (PCR) for the assessment of the environmental performance of UN CPC class 6921 Water distribution through mains (except steam and hot water) and the declaration of this performance by an EPD.

This PCR is based on the requirements and guidelines given in "PCR Basic Module, CPC Division 69: "Electricity, gas and water distribution (on own account)" dated November 30 2010.

Any comments to this PCR document may be given on the PCR Forum or directly to the PCR moderator during the period of validity.

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.

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

2 DEFINITION OF THE SERVICE GROUP

This PCR applies to water distribution through mains except steam and hot water. The ISIC – CPC's classification specifically is:

- Division 69: electricity distribution services; gas and water distribution services
  - Group 692: Water distribution (on own account)
    - **Class 6921: Water distribution through mains, except steam and hot water (on own account)**

The product group and CPC code shall be specified in the EPD: CPC 6921. More information about the product group is available on http://unstats.un.org/unsd/cr/registry/regcs.asp?Cl=25&Lg=1&Co=6921.

This PCR is relevant for the next technologies: chlorination, ozonation, use of activated carbon, desalination, osmosis, UV treatment and other filtration systems.

2.1 SPECIFICATION OF THE SERVICE COMPANY

Information about the service and the company of distribution service shall be specified in the EPD, including a description of the company and of their system of management.

The information is distinguished in mandatory and voluntary:

Mandatory information:

- Name of the service company
- Treatment and distribution site(s)
- Issuer and Contacts

Voluntary information:

- Information on environmental management systems
- Specific aspects regarding the distribution service and the location of the treatment site
- Environmental policy

2.2 SPECIFICATION OF THE SERVICE

This product category includes the collection, the treatment and the distribution of water through mains except steam and hot water. This PCR documents does not cover the use stage of water. The use of water fulfils various functions in different contexts.

The classification of the product in compliance with the national and European directive should be specified and also the analysis of a water sample about the chemical and physical parameters with the respective legal limit.

3 DECLARED UNIT/FUNCTIONAL UNIT

The functional unit (FU) shall be 1 cubic meter (m^3) of water delivered by distribution service.

The functional unit shall be declared in the EPD and the environmental impact shall be given per functional unit.

4 UNITS AND QUANTITIES

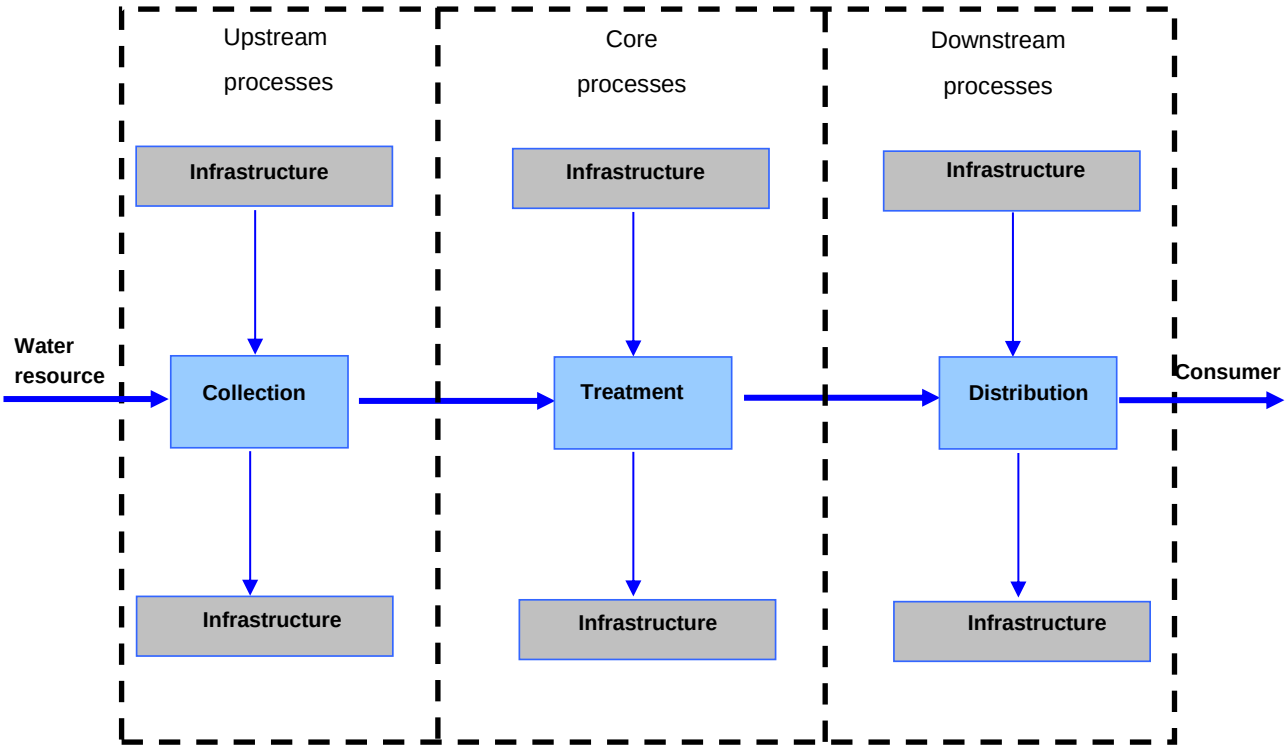
The International System of Units (SI units" shall be used in the EPD. MJ specifically should be used for electricity and fuels.

A maximum of three significant digits shall be used when reporting LCA results.

5 GENERAL SYSTEM BOUNDARIES

The life cycle for the water distribution includes upstream, core and downstream processes.

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



5.1 UPSTREAM PROCESSES

The upstream processes shall include:

- collection of water from natural or artificial springs (e.g. lake, river, well, dam)
- transportations: from spring to treatment plant
- generation of energy wares used in the treatment
- production of other substances for the treatment

5.2 CORE PROCESSES

The core processes shall include:

- treatment of water
- maintenance (machinery, equipment)
- test operations of water
- transportation of water treatment waste
- treatment or disposal of water treatment waste

5.3 DOWNSTREAM PROCESSES

The downstream processes include:

- Transportation of water to consumer through pipelines
- Average distribution losses associated with the distribution of water to consumer in the system used

Moreover it should be included the maintenance of the distribution system.

6 CORE MODULE

6.1 SYSTEM BOUNDARIES

6.1.1 TECHNICAL SYSTEM

The processes included in the core module for the distribution water through mains (except steam and hot water), shall consider the adopted system of treatment (e.g. physical treatment, chemical treatment and biologic treatment). Moreover should be included the operation of maintenance, test operations and also transportation and treatment of waste and substances.

6.1.2 GEOGRAPHICAL BOUNDARIES

The data for the core module shall be representative for the actual for the site/region where the respective process is taking place.

6.1.3 TIME BOUNDARIES

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

6.1.4 BOUNDARIES TO NATURE

The boundaries towards nature represent the flow of material and energy resources from nature into the system and emissions to air and water as well as waste out of the system.*)*

6.1.5 BOUNDARIES TO RISK ASSESSMENT

Environmental impacts due to accidents and undesired events are not part of the LCA but part of the environmental risk assessment to be reported under Additional environmental information.

Environmental burdens in conjunction with mishaps occurring more often than once in three years are considered to belong to normal operation and are part of the LCA (example: the rupture of valve, etc.) Events with environmental impact that happen less frequent than once in three years belong to the environmental risk assessment (example: the losses of chemical substances from tank).

6.2 CUT-OFF RULES

The processes and activities that contribute to less than 1% of the environmental impact for any impact category are allowed to be omitted from the inventory analysis. Activities and material that are not included in the LCA shall be documented in the EPD.

6.3 ALLOCATION RULES

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

Allocation between different products and co-products shall be based on product mass. Deviation from these allocation rules must be documented and justified.

6.4 DATA QUALITY RULES

Specific data shall be used for the Core Module. Specific data are gathered from the sites where specific processes are carried out.

Data quality requirements for the core module:

- Site-specific data shall be used for the treatment of water
- Specific data for the generation of electricity bought shall be used if possible. The data should be verifiable by invoice or similar. If site – specific data cannot be obtained, the mix of electricity used in the core module can be approximated as the official one in the country of manufacture. The mix of electricity shall be documented

6.5 CORE MODULE'S INFRASTRUCTURE UPSTREAM AND DOWN MODULES

The construction of the treatment plant and the construction of equipment are the environmentally important part and hence construction shall be included as part of the input required for this product category.

6.5.1 BOUNDARY IN TIME

The technical service life of the water treatment shall be defined and justified.

The LCA shall be valid for the reference year or reference period.

6.5.2 BOUNDARY TO NATURE

All resources from nature and emissions to nature should be included in the calculations.

6.5.3 BOUNDARY TO GEOGRAPHY

Data should reflect the geographic location or geographical region of the production site of inputs (e.g. materials or electricity)

6.5.4 EQUIPMENT AND PROCESSES INCLUDED

Infrastructure of water treatment plant, construction, reinvestments and dismantling (end of life) shall be included in the LCA:

- Water treatment plant building and other infrastructure within the site, and respective construction processes
- Machinery and other equipment for the treatment process

If dismantling is not probable the end of life may be excluded. In such case the estimated technical service is time after which 100% of upgrading and reinvestment has taken place, i.e. 100% of the machinery and 100% of concrete in waterways and dams. The need for refurbishing groundwork, digging, and transportation of filling material, etc. during the technical service life shall be estimated and included.

6.5.5 BOUNDARIES TO OTHER TECHNICAL SYSTEM AND TECHNICAL BOUNDARIES

Modern technology for production of construction materials should be assumed. For input materials and components the technology used in the geographic region where the material or component is purchased should be the basis for calculations.

Inputs and outputs to and from the life cycle from and to other technical systems shall be described.

6.5.6 DATA COLLECTION AND CUT - OFF RULES

The material composition can be gathered e.g. from the documentation from construction process, such as plans, invoices, project reports, environmental impact assessments, etc.

The need for reinvestments during technical service life shall be assessed and documented.

Compliance with the 1% - rule should be aimed for.

6.5.7 DATA QUALITY, SPECIFIC AND GENERIC DATA

Specific data should be used for:

- Construction building
- Material composition of water treatment plant
- National or regional mixes for electricity generation
- Resource use and emissions in conjunction with electricity used during the construction/reinvestment/dismantling processes.

Generic data may be used for:

- Construction equipment
- Manufacture of construction materials and chemicals
- Transportation services (fuel use and emissions in conjunction with transportation)
- Construction services
- Dismantling services
- Waste treatment processes

6.5.8 ALLOCATION

Allocation between different products and co-products shall be based on product mass.

7 UPSTREAM MODULE

7.1 SYSTEM BOUNDARIES

The processes included in the upstream module for the distribution water through mains (except steam and hot water), shall consider the collection of water from natural or artificial springs (e.g. lake, river, well, dam) and the transportation from to the treatment plant. Moreover should be included the operation of generation of energy wares used for the treatment of water and the production of other substances for the treatment of water.

Emission of gases which may be released when pressurized groundwater is pumped to surface should not be included.

7.1.1 BOUNDARIES IN TIME

Data for water collected and delivered to the treatment plant shall be valid for the reference period defined for the core module. Deviations shall be justified.

Data for production of auxiliary material and chemicals (other substances) should be valid for the reference period defined for the core module.

7.1.2 BOUNDARIES TO NATURE

All resources from nature and emissions to nature should be included in the calculations.

7.1.3 BOUNDARIES TO GEOGRAPHY

Generic data used should reflect the geographical region where the water, electricity, auxiliary material, and chemicals are purchased.

7.1.4 BOUNDARIES TO OTHER TECHNICAL SYSTEMS AND TECHNICAL BOUNDARIES

Modern technology for production of construction materials should be assumed. For input materials and components the technology used in the geographic region where the material or component is purchased should be the basis for calculations.

Inputs and outputs to and from the life cycle from and to other technical systems shall be described.

7.1.5 BOUNDARIES TO RISK ASSESSMENT

Environmental impacts due to accidents and undesired events are not part of the LCA but part of the environmental risk assessment to be reported under “additional environmental information”.

Environmental burdens in conjunction with mishaps occurring more often than once in three years are considered to belong to normal operation and are part of the LCA.

7.2 DATA COLLECTION AND CUT-OFF RULES

Information should be collected from the service company and data should be valid for the reference period defined for the core module.

Compliance with the 1% rule should be aimed for.

7.3 DATA QUALITY, SPECIFIC AND GENERIC DATA

Specific data should be used for amounts of inputs and outputs in following activities:

- Collection of water
- Distances for the transportation within the water collection chain and to the water treatment plant

For the other operations may be used generic data.

7.4 ALLOCATION

Allocation between different products and co-products shall be based on product mass

7.5 UPSTREAM PROCESSES' INFRASTRUCTURE UPSTREAM AND DOWNSTREAM MODULES

Generally infrastructure of upstream processes, e.g. construction and dismantling of water collection plant, may be included. If the artificial spring is a dam, the construction and end – life of the infrastructure should be included in the system boundaries.

Emissions from submerged vegetation occurring after flooding of from continued land run-off should not be included.

7.5.1 BOUNDARY IN TIME

See section 7.5.1.

7.5.2 BOUNDARY TO NATURE

See section 7.5.2.

7.5.3 BOUNDARY TO GEOGRAPHY

See section 7.5.3.

7.5.4 EQUIPMENT AND PROCESSES INCLUDED

Infrastructure of water collection, construction, reinvestments and dismantling (end-of-life) shall be included in the LCA:

- linepipes
- lifting apparatus
- equipment
- tank

7.5.5 BOUNDARIES TO OTHER TECHNICAL SYSTEM AND TECHNICAL BOUNDARIES

See section 7.5.5.

7.5.6 DATA COLLECTION AND CUT-OFF RULES

See section 7.5.6.

7.5.7 DATA QUALITY, SPECIFIC AND GENERIC DATA

Specific data may be used for:

- construction building
- construction linepipes
- material composition
- transportation distances
- national or regional mixes for electricity generation
- resource use and emissions in conjunction with electricity used during the construction/reinvestment/dismantling processes

Generic data may be used for:

- manufacture of construction materials and chemicals
- transportation services (fuel use and emissions in conjunction with transportation)
- construction services
- dismantling services
- waste treatment processes

8 DOWNSTREAM MODULE

The processes included in the downstream module for the distribution water through mains (except steam and hot water), shall consider the transportation of water from treatment plant to offtake point of consumer including the losses associated with the distribution of water to consumer in the system used. Moreover should be included the operation of maintenance of the system.

8.1 SYSTEM BOUNDARIES

8.1.1 BOUNDARIES IN TIME

The losses in the distribution system included in the calculations shall be valid for the reference period defined for the core module.

8.1.2 BOUNDARIES TO NATURE

All resources from nature and emissions to nature shall be included in the calculations.

8.1.3 BOUNDARIES TO GEOGRAPHY

For distribution of water, data shall reflect the distribution system actually used.

8.1.4 BOUNDARIES TOWARDS OTHER TECHNICAL SYSTEMS AND TECHNICAL BOUNDARIES

Inputs and outputs to and from the distribution system operation and maintenance activities from and to other technical systems should be described.

8.1.5 BOUNDARIES TOWARDS RISK ASSESSMENT

Environmental impacts due to accidents and undesired events are not part of the LCA but part of the environmental risk assessment to be reported under Additional environmental information.

Environmental burdens in conjunction with mishaps occurring more often than once in three years are considered to belong to normal operation and are part of the LCA.

8.2 DATA COLLECTION AND CUT-OFF RULES

Numbers on distribution losses should be based on measurements.

Compliance with the 1%-rule should be aimed for.

8.3 DATA QUALITY, SPECIFIC AND GENERIC DATA

Specific data shall be used for

- distribution losses in water distribution systems
- transportation distances

Generic data may be used for

- operation and maintenance of the distribution systems

8.4 ALLOCATION

Allocation between different products and co-products shall be based on product mass.

8.5 DOWN-STREAM PROCESSES' INFRASTRUCTURE UPSTREAM AND DOWNSTREAM MODULES

Infrastructure of the distribution system, construction, reinvestments and dismantling (end-of-life) should be included in the LCA.

8.5.1 BOUNDARY IN TIME

See section 7.5.1.

8.5.2 BOUNDARY TO NATURE

See section 7.5.2.

8.5.3 BOUNDARY TO GEOGRAPHY

See section 7.5.3.

8.5.4 EQUIPMENT AND PROCESSES INCLUDED

Infrastructure of water distribution, construction, reinvestments and dismantling (end life) shall be included in the LCA:

- linepipes
- equipment

- surge tank

8.5.5 BOUNDARIES TO OTHER TECHNICAL SYSTEM AND TECHNICAL BOUNDARIES

See section 7.5.5.

8.5.6 DATA COLLECTION AND CUT-OFF RULES

See section 7.5.6.

8.5.7 DATA QUALITY, SPECIFIC AND GENERIC DATA

Specific data shall be used for:

- construction building
- construction linepipes
- manufacture of construction materials and chemicals
- transportation distances
- national or regional mixes for electricity generation
- resource use and emissions in conjunction with electricity used during the construction/reinvestment/dismantling processes
- material composition of distribution system

Generic data may be used for

- equipment construction and end life
- construction services
- dismantling services
- waste treatment processes

8.6 CALCULATION PROCEDURES

The technical service life of the infrastructure shall be defined. The reference flow for infrastructure shall be calculated, as the technical service lifetime multiplied by the amount of cubic meter of water distributed in the system during an annual average of a reference period.

9 ENVIRONMENTAL PERFORMANCE RELATED INFORMATION

9.1 USE OF RESOURCES

The consumption of natural resources and resources per functional or declared unit shall be reported in the EPD, divided into core, upstream and downstream module.

Input parameters, extracted resources:

- 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 consumption (electricity consumption during manufacturing and use of goods or during service provision).

9.2 POTENTIAL ENVIRONMENTAL IMPACT

The environmental impact per functional or declared unit for the following environmental impact categories shall be reported in the EPD, divided into core, upstream and downstream module:

- Emissions of greenhouse gases (expressed in global warming potential, GWP, kg CO_2-equivalents, in 100 year perspective).
- Emission of ozone-depleting gases (expressed as the sum of ozone-depleting potential in kg CFC 11-equivalents, 20 years).
- Emission of acidification gases (expressed as the sum of acidification potential expresses in kg SO_2- equivalents).
- Emissions of gases that contribute to the creation of ground level ozone (expressed as the sum of ozone-creating potential, kg ethene-equivalents).
- Emission of substances to water contributing to oxygen depletion (expressed as kg PO_4^{3-}-equivalents).

The characterization factors from General Programme Instructions, Annex B shall be used.

9.3 OTHER INDICATORS

The following indicators shall be reported in the EPD, also per functional or declared unit and divided into the three modules:

- Emissions of toxic substances to water and air (kg/FU)
- Waste (kg/FU).
- Hazardous waste
- Other waste
- Land use (m^2 occupied land/FU)

9.4 ADDITIONAL ENVIRONMENTAL INFORMATION

The EPD may contain information regarding the technology utilized, the production site, the characteristics of production territory, supply/delivery information and other factors such as impacts on biodiversity, noise production and soil pollution.

Other information may be included as information about the beneficent properties and the healing effects of water for human health (e.g. diuretic, digestive), quality characteristics of water (e.g. oligomineral, high / low level of dissolved mineral salts) or the quality characteristics of springs and the sampling and analysis frequency of water.

10 CONTENT OF THE EPD

10.1 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 – for more information.

10.2 PRODUCT RELATED INFORMATION

10.2.1 SPECIFICATION OF THE PRODUCTION COMPANY

See 2.1.

10.2.2 SPECIFICATION OF THE PRODUCT

See 2.2.

10.2.3 FUNCTIONAL OR DECLARED UNIT

See 3.

10.2.4 CONTENT OF MATERIALS AND CHEMICAL SUBSTANCES

See 4.

10.2.5 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”

10.2.6 VALIDITY OF THE EPD

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

10.3 ENVIRONMENTAL PERFORMANCE-RELATED INFORMATION

10.3.1 ENVIRONMENTAL PERFORMANCE DECLARATION - MINIMUM SET OF PARAMETERS FROM THE LCA STUDY, REPORTED PER FUNCTIONAL OR DECLARED 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.

10.3.2 USE OF RESOURCES

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

See 10.1.

10.4 POTENTIAL ENVIRONMENTAL IMPACT

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

See 10.2.

10.4.1 OTHER INDICATORS

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

See 10.3.

10.4.2 ADDITIONAL ENVIRONMENTAL INFORMATION

See 10.4.

10.5 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.

10.6 VERIFICATION

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

Product Category Rules (PCR) review was conducted by: *The Technical Committee of the International EPD® System. Chair: Massimo Marino.* *Contact via info@environdec.com.*
Independent verification of the declaration and data, according to ISO 14025:2006: □ EPD process certification (internal) □ EPD verification (external)
Third party verifier: *Name and contact information* Accredited or approved by (if relevant): *Name of the accreditation body*

10.7 REFERENCES

The EPD shall, if relevant, refer to:

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

11 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.

12 CHANGES IN THIS DOCUMENT

VERSION 1.0, 2011-09-27

Original version published.

VERSION 1.01, 2013-07-18

Minor editorial changes and use of the PCR template.