

HIGHWAYS, STREETS AND ROADS

PRODUCT CATEGORY CLASSIFICATION: UN CPC 53211

2013:20

VERSION 2.1.2

VALID UNTIL: 2022-10-01



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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 declarations¹ according to ISO 14025:2006. Environmental Product Declarations (EPD) are voluntary documents for a company or organisation to present transparent information about the life cycle environmental impact for their goods or services.

The rules for the overall administration and operation of the programme are the General Programme Instructions, publicly available at www.environdec.com. A PCR complements the General Programme Instructions and the 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.

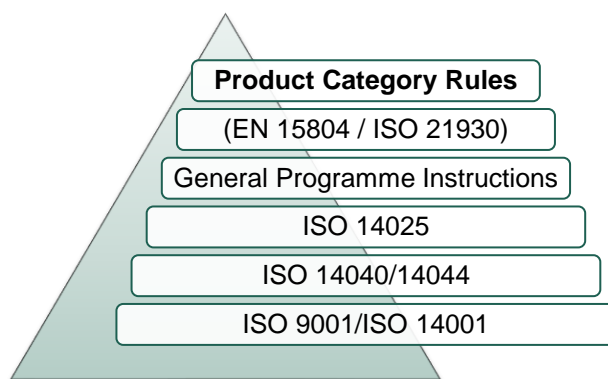


Figure 1 Illustration PCR in relation to the hierarchy of standards and other documents.

Within the present PCR, the following terminology is adopted:

- The term “shall” is used to indicate what is obligatory.
- The term “should” is used to indicate a recommendation, rather than a requirement.
- The term “may” or “can” is used to indicate an option that is permissible

For the definition of 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 via www.environdec.com. Stakeholder feedback on PCRs is very much encouraged. Any comments on this PCR document may be given via the PCR Forum at www.environdec.com or sent directly to the PCR moderator during its development or during the period of validity.


Any references to this document should 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 when necessary, and 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 EPD, Environmental Product Declarations.

2 GENERAL INFORMATION

2.1 ADMINISTRATIVE INFORMATION

Name:	Highways, streets and roads (except elevated highways)
Registration number and version:	2013:20, version 2.11
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:	Currently no appointed PCR moderator
PCR Committee:	Swedish Transport Administration (Trafikverket), Tyréns AB
Date of publication and last revision:	2022-01-24 (Version 2.1.2) Version 1.0 was published in 2013.
Valid until:	2022-10-01
Schedule for renewal:	<p>A PCR is valid for a pre-determined period of time 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 document and renewing its validity.</p> <p>A PCR document may be revised during its period of validity provided significant and well-justified proposals for changes or amendments are presented. See www.environdec.com for up-to-date information and the latest version.</p>
Standards conformance:	<ul style="list-style-type: none">General Programme Instructions of the International EPD® System, version 3.0, based on ISO 14025 and ISO 14040/14044PCR Basic Module, CPC Division 53: Constructions, version 3.01, dated 2018-11-06This PCR aims to comply with EN 15804.
PCR language(s):	This PCR was developed and is available in English. 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 Highways (except elevated highways), streets and roads and the declaration of this performance by an EPD. The product category corresponds to UN CPC UN CPC 53211.

- 532 Civil engineering works

- 5321 Highways (except elevated highways), streets, roads, railways and airfield runways
 - o **53211 Highways (except elevated highways), streets, roads**

This UN CPC subclass includes:

- highways (except elevated highways), streets, roads and other vehicular and pedestrian ways
- surfaced parking areas, driveways, pedestrian walkways and bicycle paths
- vehicular and pedestrian underpasses and overpasses
- safety installations for roads etc.

This UN CPC subclass does not include:

- elevated highways, cf. UN CPC 53221
- bridges, cf. UN CPC 53221
- highway tunnels, cf. UN CPC 53222

More information is available on <https://unstats.un.org/unsd/cr/registry/regcs.asp?Cl=25&Lg=1&Co=53211>

The product group and CPC code shall be specified in the EPD. For reading purposes, "highways, streets and roads" are hereby referred to as Road.

2.2.2 SPECIFICATION OF MANUFACTURING COMPANY AND PRODUCT

Required mandatory and recommended information about the manufacturing company is given in the table below.

Mandatory information	The infrastructure manager and owner (can be the same)
	Short description of the organisation, including information on products- or management system-related certifications (e.g., ISO Type I ecolabels, ISO 9001- and 14001-certificates, EMAS-registrations etc.) and other relevant work the organisation wants to communicate (e.g. SA 18000, supply-chain management, social responsibility - SR etc.). An environmental management system may be cited.
Recommended information	All parts and managers should be described even if the infrastructure comprises parts with different infrastructure managers and/or different technical characteristics.

Required mandatory and recommended information about the product is given in the table below.

Mandatory information	The location, boundaries and design of the infrastructure system (share of open section, share of tunnel section, and share of bridge section) shall be described. A simple visual representation or image of the product shall be given. The information may be based on a network statement.
	The extent of the project shall be described. If several activities is included, such as building a new 2+1 road and broadening of an existing road, it shall be described. The declared or functional unit shall take the whole surface into account but it can be reported separately, e.g. per m ² new 2+1 road and m ² broadening of a road.
	Unequivocal identification of the product according to the CPC classification system
	Traffic Management System characteristics
	Description of the intended use

	Annual average daily traffic (AADT)
	Road type (e.g. freeway, highway)
	Junctions
	Speed limit
	Number of lanes
	Road width
	Pavement type
	Minimum radius of curvature
	Maximum gradient
	Maximum axle loading
	Bearing capacity
	Road side equipment such as traffic barriers and road lightning
	Regular need of operation and maintenance
	All assumptions regarding life times, reinvestment intervals, service intervals etc. shall be defined and summarized in the EPD.
	Short description of the underlying LCA-based information (e.g. summary of an existing LCA study or similar studies).
Recommended information	Trade name (if found relevant)
	Short description of the underlying LCA-based information (e.g. summary of an existing LCA study or similar studies).
	Geology, geography and climate may be described if relevant.

New and existing roads

This PCR handles both new and existing roads. For new roads, all life cycle stages may be reported. For existing roads generic data may be used when modelling the construction (A1-A3) and production (A4-A5) stage. The use stage (B1-B7) shall be reported and end-of-life (C1-C4) may be reported. Repair scenarios should be modelled by the history of the road.

2.2.3 GEOGRAPHICAL REGION

This PCR is applicable to be used globally.

2.2.4 EPD VALIDITY

An EPD based on this PCR shall be valid from its registration and publication at www.environdec.com and for a five 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 indicators listed in Section 5.5.5.1,
- errors in the declared information, or
- significant changes to the declared product information, content declaration, or additional environmental 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 process described in the General Programme Instructions of the International EPD® System, including PCR review and open consultation.

3.1 PCR REVIEW

3.1.1 VERSION 1.0

Version 1.0 was reviewed by the Technical Committee of the International EPD® System.

3.1.2 VERSION 2.0

PCR review panel:	The Technical Committee of the International EPD® System. A full list of members available on www.environdec.com . The review panel may be contacted via info@environdec.com . Members of the Technical Committee were requested to state any potential conflict of interest with the PCR moderator or PCR committee, and were excused from the review.
Chair of the PCR review:	Claudia A. Peña
Review dates:	2017-11-22 until 2017-12-22

3.2 OPEN CONSULTATION

3.2.1 VERSION 1.0

Version 1.0 was available for open consultation on www.environdec.com from 2012-11-05 until 2012-12-31.

3.2.2 VERSION 2.0

This PCR was available for open consultation from 2012-11-05 until 2012-12-31, during which any stakeholder was able to provide comments by posting on the PCR forum on www.environdec.com or by contacting the PCR moderator.

Stakeholders were invited via e-mail or other means to take part in the open consultation, and were encouraged to forward the invitation to other relevant stakeholders. The following stakeholders provided comments during the open consultation, and agreed to be listed as contributors to the PCR and at www.environdec.com:

- Start2see
- HS2 Ltd.
- WSP
- IVL Swedish Environmental Research Institute

3.3 EXISTING PCRS FOR THE PRODUCT CATEGORY

As part of the development of this PCR, existing PCRs were considered in order to avoid overlaps in scope. The existence of such documents was checked in the public PCR listings of the following programmes based on ISO 14025 or similar:

- International EPD® System. www.environdec.com.

No PCRs for this product category were found in other programmes acting in accordance with ISO 14025.

3.4 REASONING FOR DEVELOPMENT OF PCR

This PCR has been developed with the consideration and harmonization with CEN standard EN 15804 "Sustainability of construction works. Environmental product declarations- core rules for the product category of construction products".

This PCR harmonizes with the PCR Basic Module template dated 2018-11-06.

This version of the PCR handles comments given on the previous version.

3.5 UNDERLYING STUDIES

During the development of version 2.0 of this PCR, other PCRs of infrastructure have been considered; e.g. bridges, elevated highways and tunnels (under revision), and railways. PCR for buildings has also been considered. EPDs of railways, roads and bridges have been studied to evaluate the PCR application. Conducted LCA studies for Western Link (Sweden) and LCA Iron Sand have been studied for information on how the PCR could be used in practice. See references in Section 7.

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.

Depending on the purpose of the EPD a declared or functional unit can be chosen. A declared unit is recommended if the LCA does not cover a full lifecycle and comparisons are to be made, for example, within the same production company with the aim to make improvements of the environmental impact from one road infrastructure project to another.

A functional unit is recommended if the aim of the EPD is to be able to compare the environmental impact of alternative road infrastructure.

4.1 DECLARED UNIT

The declared unit for road infrastructure is defined as m² of road; see Table 1.

If a declared unit is applied in the EPD it shall be specified in the EPD. The environmental impact shall be given per declared unit.

It is recommended to add information to be able to relate the declared unit to the impact of road transport, e.g. allocate the environmental impact of transport infrastructure to a transport.

Life cycle stages			Declared unit
Mandatory	Optional but recommended	Optional	
A1-A3, A4-A5	B1-B5, B6-B7	C1-C4	m ² of road. The road's overall environmental impact and the environmental impact per declared unit shall be reported.

Table 1 Definition of the declared unit of the road.

For example the results can be reported as a total of XX kg CO₂ eqv and as XX kg CO₂ eqv per m² of road.

4.2 FUNCTIONAL UNIT

The functional unit is a road with a specific intended use, see Table 2 for a definition. If the EPD is based on a functional unit it shall be specified in the EPD. The environmental impact shall be given per functional unit. The EPD shall follow a "cradle to grave" approach, i.e. including all life cycle stages of the road; see Section 4.6.

In order to compare different projects, both the function of the road and the length needs to be taken into account. The environmental performance of the road is directly dependent on its size why the environmental burden shall be reported per square meter Annual average daily traffic (AADT). This reference unit allows for roads of different types to be compared to each other.

Life cycle stages	Functional unit
Mandatory	
A1-A3, A4-A5, B1-B5, B6-B7, C1-C4	m ² of road with a specific intended use. The road's overall environmental impact and the environmental impact per m ² with the total amount of AADT stated, shall be reported.

Table 2. Definition of the functional unit of the road.

For example, the results may be reported as:

A Highway with an overall environmental impact of XX kg CO₂ eqv, and XX kg CO₂ eqv per m² Highway with an AADT specified.

4.3 RELATING THE DECLARED/FUNCTIONAL UNIT TO ENVIRONMENTAL IMPACT FROM ROAD TRANSPORT

Stated below are two examples of ways to allocate the road infrastructure impact to a road transport. If other calculation methods are used, these shall be described.

If including environmental impact from road infrastructure in a road transport, the allocation of environmental impact from road infrastructure could be made according to the following procedure:

- The environmental impact from road infrastructure (per m²) is allocated to freight and passenger transports relative to the transport work, measured as Annual Average Daily Traffic (AADT) that is performed on the infrastructure for freight and passenger transports respectively. Freight transports then get the share AADT (freight)/AADT (total) and passenger transports get the share AADT (passenger)/AADT (total).
- For freight transports, the environmental impact from road infrastructure is then allocated to the total transport utility by dividing with the number of net tonne-kilometres. For passenger transports, the allocation to transport utility is made by dividing with the number of passenger-kilometres.

4.4 REFERENCE SERVICE LIFE (RSL)

Service life of a construction product which is known to be expected under a particular set, i.e., a reference set, of in-use condition and which may form the basis of estimating the service life under other in-use conditions.

The RSL is applied to the declared and functional unit, for the calculation of maintenance and reinvestment of construction products.

4.5 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.

Approved PCRs for other parts of the road transport infrastructure, e.g. bridges and tunnels, the system boundaries specified in PCR for the subsystem shall be used. In case of conflicts between PCR for the subsystem and this PCR, system boundaries specified in PCR for the subsystem shall be used.

In harmonisation to EN 15804, the processes are divided into information modules (e.g. A1-A3, A4-A5), as shown in Figure 2. Results shall be presented by the upstream, core and downstream processes, and may be presented using the terms of modules.

For the Use stage (B1-B7) the results shall be given as an annual value based on each components reference service life (RSL), see the section below. The quality of the road at the end of the life cycle is assumed to be the same as when it was produced, so 100 % functionality can be expected at the end of the assumed lifespan.

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

4.5.1 LIFE CYCLE STAGES

For the purpose of different data quality rules and for the presentation of results, the life cycle of products is divided into three different 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. The processes included in the scope of the PCR and belonging to each life cycle stage are described in Sections 4.5.1.1–4.5.1.3.

4.5.1.1 Upstream processes

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

A1. Raw material supply:

- Extraction and production of raw material for all main parts and components
- Recycling process of recycled material used in the product, if relevant
- Impacts due to the production of electricity and fuels used in the upstream module

A2. Transport:

- Transport to the factory where raw materials are processed, and internal transports

A3. Manufacturing:

- Production of auxiliary products used such as detergents for cleaning, etc.
- Production of semiproducts used in the core process, if applicable
- Manufacturing of primary and secondary packaging
- Waste treatment of waste generated during manufacturing
- Manufacturing of materials; examples of sub-groups:
 - Production of road pavement materials, e.g. bitumen, cement, gravel production
 - Production of road substructure materials, e.g. production of piles, ballast etc.
 - Production of road equipment materials; e.g. parapets, noise barriers, wildlife fences, traffic signals, bus stops, rest stops, lightning points, drainage etc.
 - Production of road informatics devices materials, e.g. automatic road safety control systems, traffic-counting devices, weighing appliances etc.
 - Production of materials needed for tunnel construction
 - Production of materials needed for bridge construction

Upstream processes not listed may also be included. All elementary flows at resource extraction shall be included, except for the flows that fall under the general cut-off rule in Section 4.7.

4.5.1.2. Core processes

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

A4. Transport:

- External transportation to the core processes e.g. transport from the manufacturer to the construction site
- Transport from preparation to an average retailer/distribution platform
- Transport on the construction site

A5. Construction:

- Ground works
- Construction process for main parts and components
 - Construction of road pavement
 - Construction of road substructure
 - Construction of road equipment
 - Construction of road informatics devices
 - Construction of tunnels
 - Construction of bridges
 - Construction of disembarkation zones on the side of the road and parking spaces for maintenance vehicles
- Assembly of the final product

- Maintenance (e.g. of the machines) needed during construction
- Waste treatment of waste generated during construction;
- Impacts due to the production of electricity and fuels used in the core module

Manufacturing processes not listed may also be included. The production of the raw materials used for production of all product parts shall be included. A minimum of 99% of the total weight of the declared product including packaging 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.

4.5.1.3. Downstream processes

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

B1-B7. Use stage

The use stage includes the optional information modules covering the period from the handover of the road to when it is deconstructed or demolished. The following may be included:

- Any emissions to the environment during anticipated use from road construction products in use. Examples of processes: release of substances from the different layers of the road construction to air, soil or water. (Module B1)
- Maintenance, replacements of parts, during lifetime. Examples of processes: drainage of trenches/ditches, planning and gluing of road surfaces. (Module B2-B5)
- Re-investments: Includes all activities involved in replacing a road infrastructure part or object by the same or similar type of part or object. For example replacement of pavement. (Module B2-B5)
- Lifetime operation of the product including power losses and emissions, e. g. all the functions needed for operating the infrastructure. Examples of processes: roadside lighting, cleaning, salting, graveling etc. (Module B6-B7)

The process shall exclude passenger and freight transport.

C1-C4. End-of-life stage

The end-of-life stage of the road and its parts starts when it is replaced, dismantled or deconstructed and does not provide any further functionality. It can also start at the end-of-life of the road, depending on choice of the product's end-of-life scenario. The modules include provision and all transport, provision of all materials, products and related energy and water use. If the information in this module is not applicable it can be delimited; reasons shall be justified and clearly stated, and given in the EPD.

The end-of-life stage includes the following information modules:

C1. Deconstruction and demolition

- Deconstruction, dismantlement and/or demolition of the road, including initial on-site sorting of the materials.

C2. Transport

- Transports for disposal of the discarded materials and products, i.e. to a recycling site and transport of waste to final disposal.

C3. Waste processing for reuse, recovery or recycling

- Collection of waste fraction from the deconstruction site and waste processing of the materials intended for reuse, recycling and energy recovery

Materials from which energy is recovered are considered materials for energy recovery if the efficiency rate of the energy recovery process is 60 % or higher, without prejudice to existing legislation. Materials from which energy is recovered with an efficiency rate below 60 % are considered materials for incineration (from which the environmental loads are declared in module C4).

NOTE 1. Processing after the end-of-waste stage² is reached, in order to replace primary materials or fuels (as secondary materials or fuels) in another product system, are considered beyond the building's system boundaries and are assigned to module D, Benefits and Loads beyond the System Boundaries.

NOTE 2. Materials can only be considered as materials for energy recovery if they have reached the end-of-waste state.

C4 Waste disposal

- Physical pre-treatment of waste for final disposal and management of the disposal site. Module C4 quantifies all environmental loads resulting from final disposal of materials, e.g. neutralization, incineration (with or without utilization of energy) and landfilling (with or without utilization of landfill gases).

Environmental loads from waste disposal are considered part of the road's product system, according to the "polluter pays principle". If the waste disposal process generates energy such as heat and power the potential benefits from utilization of such energy in the next product system are assigned to Module D.

4.5.2 OTHER BOUNDARY SETTING

4.5.2.1. Boundary towards 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.

4.5.2.2. Boundaries in the life cycle

See Section 4.5.1. The EPD may present the information divided into additional sub-divisions.

4.5.2.3. Boundaries towards other technical systems

See Section 4.8.2.

4.6 SYSTEM DIAGRAM

The system diagram is shown in Figure 2 and is explained in the following sections of section 4.

² See En15804 Annex B for explanation of end-of-waste.

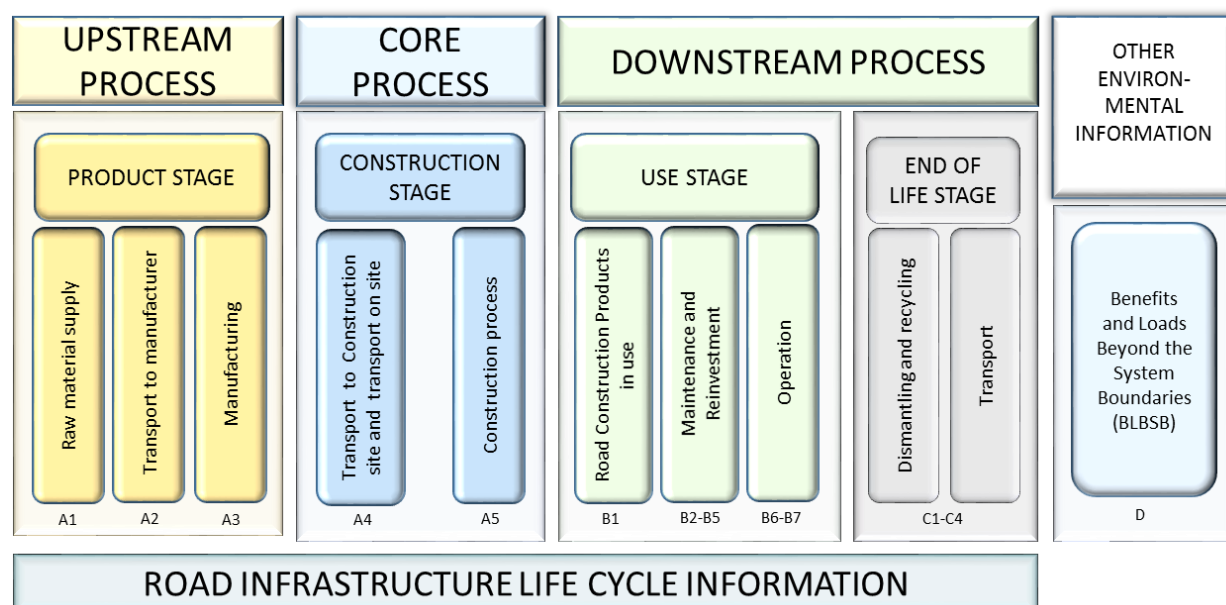


Figure 2 System diagram illustrating the processes that are included in the product system, divided into upstream, core and downstream processes.

4.7 CUT-OFF RULES

Data for elementary flows to and from the product system contributing to a minimum of 99% of the declared environmental impacts shall be included (not including processes that are explicitly outside the system boundary).

The check for cut-off rules in a satisfactory way is through the combination of expert judgment based on experience of similar product systems and a sensitivity analysis in which it is possible to understand how the un-investigated input or output could affect the final results.

4.8 ALLOCATION RULES

4.8.1 CO-PRODUCT ALLOCATION

The following step-wise procedure shall be applied for multifunctional products and multiproduct processes:

1. Allocation shall be avoided, if possible, by dividing the unit process into two or more sub-processes and collecting the environmental data related to these sub-processes.
2. If allocation cannot be avoided, the inputs and outputs of the system shall be partitioned between its different products or functions in a way that reflects the underlying physical relationships between them; i.e. they should reflect the way in which the inputs and outputs are changed by quantitative changes in the products or functions delivered by the system.
3. Where physical relationships alone cannot be established or used as the basis for allocation (or they are too time consuming), the most suitable allocation procedure shall be used and documented.

4.8.2 REUSE, RECYCLING, AND RECOVERY

In the framework of the International EPD® System, the methodological choices for allocation for reuse, recycling and recovery have been set according to the polluter pays principle (PPP). This means that the generator of the waste shall carry the full environmental impact until the point in the product's life cycle at which the waste is transported to a scrapyard or the gate of a waste processing plant (collection site). The subsequent user of the waste shall carry the environmental impact from the processing and refinement of the waste but not the environmental impact caused in the "earlier" life cycles. See General Programme Instruction for further information and examples.

4.9 DATA QUALITY REQUIREMENTS

An LCA calculation requires two different kinds of information:

- data related to the **environmental aspects** of the considered system (such materials or energy flows that enter the production system). These data usually come from the company that is performing the LCA calculation.
- data related to the **life cycle impacts** of the material or energy flows that enter the production system. These data usually come from databases.

Data on environmental aspects shall be as specific as possible and shall be representative of the studied process.

Data on the life cycle of materials or energy inputs are classified into three categories – specific data, selected generic data, and proxy data, 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, and data from other parts of the life cycle traced to the specific product system under study, e.g. materials or electricity provided by a contracted supplier that is able to provide data for the actual delivered services, transportation that takes place based on actual fuel consumption, and related emissions, etc.,
- **generic data** (sometimes referred to as “secondary data”), divided into:
 - **selected generic data** – data from commonly available data sources (e.g. commercial databases and free databases) that fulfil prescribed data quality characteristics for precision, completeness, and,
 - **proxy data** – data from commonly available data sources (e.g. commercial databases and free databases) that do not fulfil all of the data quality characteristics of “selected generic data”.

As a general rule, specific data shall always be used, if available, after performing a data quality assessment. It is mandatory to use specific data for the core processes as defined above. For the upstream processes, downstream processes, and infrastructure, generic data may also be used if specific data are not available. Generic data should especially be used in cases where 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. If selected generic data that meets the requirements of the International EPD® System are not available as the necessary input data, proxy data may be used and documented. The environmental impacts associated to proxy data must not exceed 10% of the overall environmental impact from the product system.

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

If an approved EPD or PCR (within the International EPD-system or other EPD-programmes) exists for a product or service that is similar to a product or service within the system under study, data from EPD can be used as specific data and PCR can be used for developing specific data, under the condition that all critical system boundaries are similar.

If transport modes and distances for material transports are not known, assumed distances should be documented and calculated as freight transports based on data from databases.

For fuels, energy carriers, materials and chemicals the technology used in the geographic region where the fuel/energy carrier/material/chemical is purchased should be the basis for calculations. Inflow of recycled material and the outflow of materials for recycling and waste treatment shall be declared according to section 4.8.2.

All assumptions regarding lifetimes, reinvestment intervals, service intervals etc. shall be defined and summarized in the EPD.

4.9.1 RULES FOR USING GENERIC DATA

The attributional LCA approach in the International EPD® System forms the basic prerequisites for selecting generic data. To allow the classification of generic data as “selected generic data”, they shall fulfil selected prescribed characteristics for precision, completeness, and representativeness (temporal, geographical, and technological), such as:

- the reference year must be as current as possible and preferably assessed to be representative for at least the validity period of the EPD,
- the cut-off criteria to be met on the level of the modelled product system are the qualitative coverage of at least 99% of energy, mass, and overall environmental relevance of the flows,

- completeness in which the inventory data set should, in principle, cover all elementary flows that contribute to a relevant degree of the impact categories, and
- the representativeness of the resulting inventory in the given temporal, technological, and geographical reference should, as a general principle, be better than $\pm 5\%$ of the environmental impact of fully representative data.

Section 4.10 provides a list of recommended databases/data sets to be used for generic data.

If selected generic data that meets the requirements of the International EPD® System are not available as the necessary input data, proxy data may be used and documented. The environmental impacts associated with proxy data shall not exceed 10% of the overall environmental impact from the product system.

The EPD may include a data quality declaration to demonstrate the share of specific data, selected generic data and proxy data for the environmental impacts.

4.10 RECOMMENDED DATABASES FOR GENERIC DATA

No specific databases are recommended for generic data.

4.11 IMPACT CATEGORIES AND IMPACT ASSESSMENT

The EPD shall declare the default impact categories as described in the General Programme Instructions. The characterisation models and factors to use for the default impact categories are available on www.environdec.com and shall be updated on a regular basis based on the latest developments in LCA methodology and ensuring the market stability of EPDs. 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.

4.12 OTHER CALCULATION RULES AND SCENARIOS

4.12.1 UPSTREAM PROCESSES

The following requirements apply to the upstream processes:

- Data referring to processes and activities upstream in a supply chain over which an organisation has direct management control shall be specific and collected on site.
- Data referring to contractors that supply main parts, packaging, or main auxiliaries should be requested from the contractor as specific data, as well as infrastructure, where relevant.
- The 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 based on the actual transportation mode, distance from the supplier, and vehicle load.
- Transport from the final delivery point of raw materials, chemicals, main parts and components to the manufacturing plant/place of service provision should be 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.
- For the electricity used in the upstream processes, electricity production impacts shall be accounted for in this priority when specific data are used in the upstream processes:
 1. Specific electricity mix as generated, or purchased, from an electricity supplier, demonstrated by a Guarantee of Origin (or similar, where reliability, traceability, and the avoidance of double-counting are ensured) as provided by the electricity supplier. If no specific mix is purchased, the residual electricity mix from the electricity supplier shall be used.³

³ The residual electricity mix is the mix when all contract-specific electricity that has been sold to other customers has been subtracted from the total production mix of the electricity supplier.

2. National residual electricity mix or residual electricity mix on the market
3. National electricity production mix or electricity mix on the market.

The mix of electricity used in upstream processes shall be documented in the EPD, where relevant.

4.12.2 CORE PROCESSES

The following requirements apply to the core processes:

- 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.
- The environmental load from construction work connected to the building of transport infrastructure can be calculated in the following different ways, without the assumptions made contributing to the 10 % rule for proxy data:
 - Based on specific data on the type of work that has been done, e.g. drilling, blasting, excavation, and the amounts of material that has been handled. Qualified assumptions can then be made for machine hours and energy consumption, which makes it possible to calculate environmental load.
 - Based on specific data on the consumption of fuel, electricity and other resources that are used in the construction work. Qualified assumptions can then be made for assembly of machinery, which makes it possible to calculate environmental load.
 - Based on specific data on the assembly of machinery (type and number of machines) and the time the construction work has been going on. Qualified assumptions can then be made for machine hours and energy consumption, which makes it possible to calculate environmental load.
- For the electricity used in the core processes, electricity production impacts 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, where reliability, traceability, and the avoidance of double-counting are ensured) as provided by the electricity supplier. If no specific mix is purchased, the residual electricity mix from the electricity supplier shall be used.⁴
 2. National residual electricity mix or residual electricity mix on the market
 3. National electricity production mix or electricity mix on the market.

The mix of electricity used in the core processes shall be documented in the EPD, where relevant.

- 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.
- Transport from the manufacturing plant/place of service provision to construction site (see above regarding upstream processes) should be based on the actual transportation mode, distance from the supplier and vehicle load.
- Waste treatment processes of manufacturing waste should be based on specific data, if available.

All assumptions made, as described above, shall be justified and documented.

4.12.3 DOWNSTREAM PROCESSES

The following requirements apply to the downstream processes:

- Data for the use stage are usually based on scenarios, but specific data should be used when available and relevant.
- Data on the pollutant emissions from the use stage should be based on documented tests, verified studies in conjunction with average or typical product use, or recommendations concerning suitable product use. Whenever applicable, test methods shall be internationally recognised.

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 production mix of the electricity supplier.

- The use of electricity in the region/country where the product is used (as specified in the geographical scope of the EPD) shall be accounted for in the following priority:
 1. National residual electricity mix or residual mix on the market
 2. National electricity production mix or electricity mix on the market

The mix of electricity used in the downstream processes shall be documented in the EPD, where relevant.

- The transport of the product to the customer shall be described in the reference PCR, which should reflect the actual situation to the best extent possible. The following priority should be used:
 1. Actual transportation distances and types.
 2. Calculated as the average distance of a product of that product type transported by different means of transport modes.
 3. Calculated as a fixed long transport, such as 1 000 km transport by lorry or 10 000 km by airplane, according to product type.
- The production and transportation of any component and ancillary products used, including cleaning
- Transportation of any waste from modules B1-B7 or from their related transportation
- The end-of-life processes of any waste from transportation for modules B1-B7, including any part of the component and ancillary materials removed.
- Scenarios for the end-of-life stage shall be technically and economically practicable and compliant with current regulations in the relevant geographical region based on the geographical scope of the EPD. Key assumptions regarding the end-of-life stage scenario shall be documented.

Key assumptions regarding the end-of-life stage shall be documented.

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 via www.environdec.com

As a general rule the EPD content:

- shall be in line with the requirements and guidelines in ISO 14020 (Environmental labels and declarations - General principles),
- shall be verifiable, accurate, relevant and not misleading, and
- shall not include rating, judgements or direct comparison with other products.

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

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 subject to the same verification procedure.

5.2 UNITS AND QUANTITIES

The following requirements apply for units and quantities:

- The International System of Units (SI units) shall be used, 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 (m³)
 - 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.
- Three significant figures⁵ should be adopted for all results, The number of significant digits shall be appropriate and consistent.
- 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.
- The result tables shall:
 - Only contain values or the letters "INA" (Indicator Not Assessed). It is not possible to specify INA for mandatory indicators. INA shall only be used for voluntary parameters that are not quantified because no data is available.⁶
 - Contain no blank cells, hyphens, less than or greater than signs or letters (except "INA").

⁵ Significant figures are those digits that carry meaning contributing to its precision. For example with two significant digits, the result of 123.45 shall be displayed as 120, and 0.12345 shall be displayed as 0.12. In scientific notation, these two examples would be displayed as $1.2 \cdot 10^2$ and $1.2 \cdot 10^{-2}$.

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

- 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 CONTENT DECLARATION

The EPD shall include a content declaration of the product covering relevant materials and substances included in the road infrastructure. Resources, which contribute 1% or more of the different resource use categories, shall be listed and detailed. The content declaration shall have the form of a list of materials and chemical substances including information on their environmental and hazardous properties. The gross weight of material shall be declared in the EPD® at a minimum of 99 % of one unit of product.

The declaration of material content of the product shall declare chemical products that contain substances, in a concentration above 0.1 % (w/w), meeting the criteria of Substances of Very High Concern (SVHC) in REACH article 33. The declaration shall include name of SVHC substance, CAS number, risk phrase, content of SVHC substance weight-by-weight (w/w) and the total quantity of the chemical product in kilograms. Both built-in chemicals and the use of chemical products shall be declared.

5.4 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 should 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.

5.5 EPD REPORTING FORMAT

The reporting format of the EPD shall include the following sections:

- Cover page (see Section 5.5.1)
- Programme information (see Section 5.5.2)
- Product information (see Section 5.5.3)
- Content declaration (see Section 5.5.4)
- Environmental performance (see Section 5.5.5)
- Additional environmental information (see Section 5.5.6)
- References (see Section 5.5.9)

The following information shall be included, when applicable:

- Information related to Sector EPDs (see Section 5.5.6)
- Differences versus previous versions (see Section 5.5.8)
- Executive summary in English (see Section □)

5.5.1 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 operator⁷,
- *Date of publication (issue): 20XX-YY-ZZ,*
- *Date of revision: 20XX-YY-ZZ, when applicable,*
- *Date of validity: 20XX-YY-ZZ*
- A note that “An EPD should provide current information, and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com.”
- A statement of conformity with ISO 14025,

5.5.2 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 mandatory statement from ISO 14025: “EPDs within the same product category but from different programmes may not be comparable.”
- A statement that the EPD owner has the sole ownership, liability and responsibility of the EPD
- Information about verification⁸ and reference PCR in a table with the following format and contents:

Product category rules (PCR): PCR 2013:20 Highways, streets and roads (except elevated highways), version 2.1, UN CPC 53211.
PCR review was conducted by: The Technical Committee of the International EPD® System. Review chair: Claudia A. Peña Contact via info@environdec.com .
Independent third-party verification of the declaration and data, according to ISO 14025:2006: <input type="checkbox"/> EPD process certification <input type="checkbox"/> EPD verification
Third party verifier: <name, organisation and signature of the third party verifier> <i>In case of certification bodies:</i> Accredited by: <name of the accreditation body and accreditation number, if applicable>. <i>In case of individual verifiers:</i> Approved by: The International EPD® System Technical Committee, supported by the Secretariat
Procedure for follow-up of data during EPD validity involves third party verifier: <input type="checkbox"/> Yes <input type="checkbox"/> No

5.5.3 PRODUCT INFORMATION

The product information section of the EPD shall include:

- Address and contact information to EPD owner,

⁷ The EPD shall not include a “registration number” if such is provided by the certification body, as this may be confused with the registration number issued by the programme operator.

⁸ If the EPD has been verified by an approved individual verifier who has received contractual assistance from a certification body that is not accredited, this certification body shall not be included in this table.

- Description of the organisation. This may include information on products- or management system-related certifications (e.g. ISO 14024 Type I environmental labels, ISO 9001- and 14001-certificates and EMAS-registrations) and other relevant work the organisation wants to communicate (e.g. SA 8000, supply-chain management and social responsibility),
- Name and location of production site,
- Product identification by name, and an unambiguous identification of the product by standards, concessions or other means,
- Identification of the product according to the UN CPC scheme system. Other relevant codes for product classification may also be included, e.g.
 - Common Procurement Vocabulary (CPV),
 - United Nations Standard Products and Services Code® (UNSPSC),
 - Classification of Products by Activity (NACE/CPA) or
 - Australian and New Zealand Standard Industrial Classification (ANZSIC),
- Description of the product, its application/intended use and technical functions, e.g. expected service life time,
- 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,
- Functional unit or declared unit,
- Reference service life (RSL), if applicable,
- 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,
- 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,
- Additional information about the underlying LCA-based information, such as assumptions, cut-off rules, data quality and allocation.

5.5.4 CONTENT DECLARATION

The content declaration shall have the form of a list of materials and chemical substances including information on their environmental and hazardous properties. The gross weight of material shall be declared in the EPD at a minimum of 99 % of one unit of product.

Information on the hazardous properties of materials and chemical substances should follow the requirements given in the latest revision of the Globally Harmonized System of Classification and Labelling of Chemicals (GHS)⁹, issued by 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)
- 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

⁹ The GHS document is available on www.unece.org.

5.5.4.1. Information about recycled materials

Not relevant for this product category.

5.5.5 ENVIRONMENTAL PERFORMANCE

In harmonisation to EN 15804, the processes are divided into information modules (e.g. A1-A3, A4-A5), as shown in Figure 2. Results shall be presented by the upstream, core and downstream processes, and may be presented using the terms of modules.

5.5.5.1. Environmental impacts

The indicators related to potential environmental impact listed in Table 3 shall be declared per functional unit or declared unit, and per life cycle stage.

PARAMETER		UNIT	A1	A2	etc.
Global warming potential (GWP)	Fossil	kg CO ₂ eq.			
	Biogenic	kg CO ₂ eq.			
	Land use and land transformation	kg CO ₂ eq.			
	TOTAL	kg CO ₂ eq.			
Acidification potential (AP)		kg SO ₂ eq.			
Eutrophication potential (EP)		kg PO ₄ ³⁻ eq.			
Formation potential of tropospheric ozone (POCP)		kg C ₂ H ₄ eq.			
Abiotic depletion potential – Elements		kg Sb eq.			
Abiotic depletion potential – Fossil fuels		MJ, net calorific value			
Water scarcity potential		m ³ eq.			

Table 3 Indicators describing potential environmental impacts¹⁰.

Notes:

- Abiotic depletion potential is calculated and displayed as two separate indicators. ADP-fossil fuels include all fossil resources, while ADP-elements include all non-renewable material resources.

5.5.5.2. Use of resources

The indicators for resource use based on the life cycle inventory (LCI) listed in Table 4 shall be declared per functional unit or declared unit, and per life cycle stage.

PARAMETER		UNIT	A1	A2	etc.
Primary energy resources – Renewable	Use as energy carrier	MJ, net calorific value			

¹⁰ Please check www.environdec.com for the latest list of default impact categories, units and characterisation factors as they may have been updated compared to this table.

	Used as raw materials	MJ, net calorific value			
	TOTAL	MJ, net calorific value			
Primary energy resources – Non-renewable	Use as energy carrier	MJ, net calorific value			
	Used as raw materials	MJ, net calorific value			
	TOTAL	MJ, net calorific value			
Secondary material		kg			
Renewable secondary fuels		MJ, net calorific value			
Non-renewable secondary fuels		MJ, net calorific value			
Net use of fresh water		m ³			

Table 4 Indicators describing use of primary and secondary resources.

Notes:

- In order to identify the primary energy used as an energy carrier (and not used as raw materials), the parameter may be calculated as the difference between the total input of primary energy and the input of energy resources used as raw materials.
- Energy content of biomass used for feed or food purposes shall not be considered.
- The net use of fresh water does not constitute a “water footprint” as potential environmental impacts due to the water use in different geographical locations is not captured. For this indicator:
 - Evaporation, transpiration, product integration, release into different drainage basins or the sea, displacement of water from one water resource type to another water resource type within a drainage basin (e.g. from groundwater to surface water) is included.
 - In-stream water use is not included.
 - For water used in closed loop processes (such as cooling system) and in power generation only the net water consumption (such as reintegration of water losses) should be considered.
 - Seawater shall not be included
 - Tap water or treated water (e.g. from a water treatment plant), or wastewater that is not directly released in the environment (e.g. sent to a wastewater treatment plant) are not elementary water flows, but intermediate flows from a process within the technosphere.
 - Additional transparency in terms of geographical location, type of water resource (e.g. groundwater, surface water), water quality and temporal aspects may be included as additional information.

5.5.5.3. Waste production and output flows

Waste generated along the whole life cycle production chains shall be treated following the technical specifications described in the General Programme Instructions. When the amount of waste or the output flows is from the life cycle inventory (LCI) are declared, the indicators in Table 5 and Table 6 shall be reported per functional unit or declared unit, and per life cycle stage.

PARAMETER	UNIT	A1	A2	etc.
Hazardous waste disposed	kg			
Non-hazardous waste disposed	kg			

Radioactive waste disposed	kg			
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Table 5 Indicators describing waste production.

PARAMETER	UNIT	A1	A2	etc.
Components for reuse	kg			
Material for recycling	kg			
Materials for energy recovery	kg			
Exported energy, electricity	MJ			
Exported energy, thermal	MJ			

Table 6 Indicators describing output flows.

Notes:

- The parameters are calculated on the gross amounts leaving the system boundary of the product system in the LCI. If e.g. there is no gross amount of "exported energy, electricity" leaving the system boundary, this indicator is set to zero,
- The parameter "Materials for energy recovery" does not include materials for waste incineration. Waste incineration is a method of waste processing, when $R1 < 60\%$ (European Guideline on R1 energy interpretation), and is allocated within the system boundary.
- In case there are never any flows of these types leaving the system boundary for a product category, the indicators may be removed by the PCR.

5.5.5.4. Other environmental indicators

The reference PCR may add other environmental indicators to include for the product category from the inventory or impact assessment. Such indicators should be based on international standards or similar methodologies developed in a transparent procedure. Reference to the chosen indicators and methodologies shall be reported.

The following potential environmental impacts may be calculated and reported in the EPD®:

- Emission of ozone-depleting gases (expressed as the depletion potential of the stratospheric ozone layer, ODP kg CFC 11 equiv)

Other impact indicators that may be reported and calculated. All methods shall be described and the results shall be reported separately in the EPD:

- Carbon sequestration
- Temporary carbon storage and Delayed emissions
- Emissions of Biogenic Carbon
- Carbonation
- Indirect land use change
- Soil carbon change
- Human toxicity

Note that for the EPD to be in full compliance with EN15804 all impact indicators shall be reported.

5.5.6 ADDITIONAL INFORMATION

For approved PCRs for other parts of the road transport infrastructure, e.g. bridges and tunnels, the specified impact indicators in PCR for the subsystem shall be used. In case of conflicts between PCR for the subsystem and this PCR, the impact indicators specified in PCR for the subsystem shall be used.

Benefits and loads beyond the system boundaries (BLBSB), Module D, aims at transparency for the environmental benefits or loads resulting from reusable and recyclable materials and/or useful energy carriers leaving a product system e.g. as secondary materials or fuels.

Any declared net benefits and loads from net flows leaving the product system that have not been allocated as co-products and that have passed the end-of-waste state shall be included in module D (see General Programme Instructions).

Avoided impacts from allocated co-products shall not be included in Module D.

5.5.6.1. Impacts on biodiversity

Impact on the following core principles for biodiversity may be described:

- Permeability of transport corridors
- Safety and mortality
- Disturbance of Surrounding habitats
- Conservation of habitats
- Natural flora and fauna
- Created natural values

5.5.6.2. Noise and vibrations:

The following parameters shall be addressed:

- Direct impact from infrastructure construction, maintenance and operation as well as from traffic, according to national set of regulations such as guide-line/limit/threshold values and using national methods of measurement or modelling.
- Impacts on relevant areas such as residential areas, sensitive biotopes or recreational areas, if relevant with comparison to a business as usual scenario.
- Undertaken measurements for improvement of impacts from traffic noise and vibrations.
- Other impacts not shown by chosen indicators.

5.5.6.3. Water management

The following shall be addressed:

- Environmental impacts on water flows, groundwater levels, and water quality, both temporary under construction and permanent during operation of the infrastructure, shall be described.
- Measures taken to ensure that an acceptable ecological status is maintained in water flows, groundwater levels, and water quality during construction and operation phase of the infrastructure should be described.
- A description how non-harmful groundwater levels could be maintained during operation of the infrastructure.
- A description of the systems and routines used to ensure that environmental impacts on water flows, groundwater levels, and water quality, both temporary during construction and during operation of the infrastructure, are kept at acceptable levels.

If measures can be taken to minimize risk for causing ecological imbalance in water flows, groundwater levels, and/or water quality during construction of the infrastructure, it should be accounted for in the transport infrastructure PCR.

5.5.7 INFORMATION RELATED TO SECTOR EPDS

For sector EPDs, the following information shall also be included:

- 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.

5.5.8 DIFFERENCES VERSUS PREVIOUS VERSIONS

For EPDs that have been updated, the following information shall also be included:

- a description of the differences versus previously published versions, e.g. a description of the percentage change in results and the main reason for the change;
- a revision date on the cover page

5.5.9 REFERENCES

This section shall include a list of references, including the General Programme Instructions (including version number), standards and PCR (registration number, name and version). The source and version of the characterisation models and the factors used shall be reported in the EPD

- The underlying LCA
- The name, CPC code and version number of the PCR used
- Other documents that verify and complement the EPD®
- Instruction for recycling, if relevant
- The General Programme instructions of the International EPD® System

5.5.10 EXECUTIVE SUMMARY IN ENGLISH

For EPDs published in another language than English, an executive summary in English shall be included.

The executive summary should contain relevant summarised information related to the programme, product, environmental performance, additional information, information related to sector EPDs, references and differences versus previous versions.

6 GLOSSARY

CO ₂	Carbon dioxide
CPC	Central product classification
EPD	Environmental product declaration
ISO	International Organization for Standardization
kg	kilogram
LCA	Life cycle assessment
PCR	Product Category Rules
SI	The International System of Units
SO ₂	Sulphur dioxide
UN	United Nations

7 REFERENCES

CEN (2013), EN 15804:2012+A1:2013, Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products.

Environmental Product Declaration N-340 road, product group: UN CPC 53211, Reg. no. S-P-00516, 2013-12-19

Environmental Product Declaration for railway bridges on the Bothnia Line, UN CPC 53212, Reg. no. S-P-00199, 2010-03-19

Environmental Product Declaration for the concept of the NCC Composite bridge, UN CPC 53221/CPV 45221110-6, Reg. no. S-P-00627, 2014-11-04

EPD International (2017) General Programme Instructions for the International EPD® System. Version 3.0, dated 2017-12-11.
www.environdec.com

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

ISO (2004), ISO 8601:2004 Data elements and interchange formats – Information interchange – Representation of dates and times

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 (2007), ISO 21930:2007, Sustainability in building construction -- Environmental declaration of building products

ISO (2013), ISO/TS 14067:2013, 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

ISO (2014a), ISO 6707-1:2014, Buildings and civil engineering works -- Vocabulary -- Part 1: General terms

ISO (2017), ISO 21930:2017, Sustainability in buildings and civil engineering works -- Core rules for environmental product declarations of construction products and services

NS-EN 15643-1 2010. Sustainability of construction works - Sustainability assessment of buildings - Part 1: General framework, European Committee for Standardization, Brussels, Belgium

PCR 2013:20, Highways (except elevated highways), streets and roads, version 1.03, International EPD® System. (PCR has expired)

PCR BRIDGES AND ELEVATED HIGHWAYS, product group: UN CPC 53221, 2013:23, version 1.01 valid until: 2016-12-20 (PCR has expired)

PCR BRIDGES, ELEVATED HIGHWAYS AND TUNNELS, product group: UN CPC 53221, 53222. PCR replacing 2013:23. (This is a draft version for open consultation. Not a valid PCR)

PCR RAILWAYS, product group: UN CPC 53212, 2013:19, version 1.04 (PCR has expired)

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Trafikverket, Samhällsekonomiska principer och kalkylvärden för transportsektorn: ASEK 5.2 Kapitel 3 Kalkylprinciper och generella kalkylvärden, 2015-04-01. (Acquired 2017-04-24
http://www.trafikverket.se/contentassets/823481f052a74a3881492136383eb01b/filer/03_generella_principer_o_varden_a52.pdf)

Trafikverket (2015), LCA Västra Länken (LCA Western Link)

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8 VERSION HISTORY OF PCR

VERSION 1.0, 2013-10-18

Original version.

VERSION 1.01, 2013-11-21

Minor editorial changes and corrections in cross-references of figures and sections.

VERSION 1.01, 2014-02-28

Minor changes by the Secretariat without any impact on the technical aspects or methodological guidance:

- Information added to cover page
- Information added to General Information
- General introduction changed to latest version
- Minor editorial changes

VERSION 1.03, 2016-04-07

Corrected validity date on cover page to 2016-10-18.

VERSION 2.0, 2018-01-10

Revised PCR with changes according to PCR Basic Module, 2015-12-22, and in harmonization with EN 15804. Changes:

- System boundaries and the allocation of stages to upstream, core and downstream processes
- Functional/declared unit
- Impact indicators added
- Additional environmental information

VERSION 2.1, 2019-04-16

- Updated in accordance with GPI 3.0 and new PCR basic module.
- PCR moderator removed

VERSION 2.1.2, 2022-01-24

- Validity period extended until 2022-10-01, the expected publication date of the new complementary PCR (c-PCR) developed to replace this PCR, in line with Section 5.5.2.1 of the GPI.

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