ITB-EPD

general ITB-PCR A, v1.6

based on PN-EN 15804+A2:2020-03

Instytut Techniki Budowlanej

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1 Introduction

This document (General ITB-PCR A version 1.6, 2022) has been updated by the ITB-EPD Technical Committee based on the requirements of PN-EN 15804+A2:2020-03 and is a part of ITB-EPD Programme.

ITB-PCR A provides the product category rules for products used in the construction sector and specifies the calculation rules for Life Cycle Assessment (LCA) that should be applied in the ITB-EPD program as well as the requirements on an ITB-EPD document and a supplementary technical report. It also provides a core structure ensuring that an ITB-EPD is developed in accordance with PN-EN 15804+A2:2020-03 and fulfil the requirements of ISO 14025.

Environmental Product Declaration an ITB-EPD communicates reliable and verified environmental information on products used in the construction sector and their applications, thereby supports decision-making process and stimulates the industry to continuous improvements of its environmental performance.

Environmental information presented in an ITB-EPD shall be provided in data packages representing various stages of a product's life cycle divided and assigned in compliance with PN-EN 15804+A2. Requirements of ITB-PCR A must ensure that the data presented are consistent, reproducible and comparable.

ITB-PCR A obligate to declare a limited number of predetermined parameters associated with environmental impacts and aspects related to the resource (see 3.2.13).

The internal and external verification process of an ITB-EPD is performed in accordance with ISO 14025.

Revisions of ITB-PCR A shall be performed by the ITB-EPD Technical Committee in line with the revision of EN 15804 standard.

Note: the use of this PCR-A is optional in 2022 and is mandatory/obligatory from 2023.

2 Scope

ITB-PCR A provides product category rules for Type III Environmental Product Declarations issued by ITB (National EPD provider in Poland) and can be applied for any product that is used in the construction sector.

ITB-PCR A:

- defines the parameters to be declared and the way in which they are collated and reported,
- describes which stages of a product's life cycle are considered in an ITB-EPD and which processes are to be included in life cycle stages,
- defines rules for the use and end-of-life scenarios,
- includes the rules for LCI collection and Life Cycle Impact Assessment underlying the EPD, including the specification of the data quality to be applied,
- includes the rules for reporting additional information, that is not covered by LCA.

3 Content

3.1 Basic information

An ITB-EPD should provide quantified environmental information on a declared product, developed based on a harmonized, scientific and formal basis. The structure of an ITB-EPD shall follow the requirements of the latest versions of EN 15804 and ISO 14025 standards. An ITB-EPD technical report (electronic verison) must be accessible by the verifier under the conditions of confidentiality established within specific agreement.

The EPD report shall contain the following general information (see details in 3.2.14):

- ITB-EPD number (number registered in the system)
- name of a product,
- ITB logo and contact details,
- an ITB-EPD owner name (client) and contact details,
- issuance, revision/validation (optional) and validity date,
- manufacturing sites location,
- information that the Life Cycle Assessment was performed in accordance with the requirements of ITB-PCR A with reference to EN 15804,
- statement: This declaration is the Type III Environmental Product Declaration (EPD) based on EN 15804 and verified according to ISO 14025. It contains information about the impacts of a declared product on the environment and their aspects verified by the independent body according to ISO 14025,
- comparability statement: Basically, a comparison, or evaluation of ITB-EPD data is possible only if all the compared data were created according to EN 15804,
- declared unit / functional unit.
- ECO-EPD verified logo and link to Eco-Platform organization.

An ITB-EPD owner is responsible for reliability and validity of all information presented in the document. An ITB-EPD owner is obligated to promptly inform ITB about any changes occurred that could influence on the environmental assessment presented in an ITB-EPD.

An ITB-EPD is based on SI European units.

3.2 LCA information

3.2.1 Goal of the study

It should be stated what is the goal of the study:

- reasons for performing the study, target group i.e. to whom an ITB-EPD is addressed: business-to-business (B2B) or business-to-consumer (B2C) communication.

3.2.2 Product description

Product description shall be based on reliable source of technical information such as Declaration of Performance (preffered) or technical information available on the manufacturer website or dedicated scientific literature. The declared product must be described based on the technical and functional specifications. Product declared, or functional unit shall have possibility

to be recalculated to the commercial product unit that can be used for construction e.g. 1 brick, kg/m^2 etc. Product application must be also declared. The manufacturing process shall be provided in EPD (diagram preffered).

3.2.3 Declared / functional unit

LCA of a product must be calculated for a declared or functional unit as specified in PN-EN 15804+A2. This information shall be provided as the essential information for ITB-EPD.

Note: *In specific cases of additions or validation of older EPDs by 2025, the EPD can be calculated in accordance with EN 15804+A1. In this case, the previous PCR-A document shall be used.*

A declared / functional unit may be declared as a part of the prescribed product unit: 1 kg, 1 ton, 1 m, m^2, m^3 or specific item or other (if justifeid).

If the entire life cycle of a product is to be declared, a functional unit can be referred in compliance with PN-EN 15804. If the entire life cycle is declared, it is imperative that a reference service life (RSL) is indicated.

Declaration of durability or RSL product may be optional for declared unit and owner is fully responsible for this value.

3.2.4 Data collection period

Data collection period for specific LCI data (representative year for production) and for generic data shall be specified. Preferably from last year or 2 years old.

LCI data for a representative year shall be verified and documented (see ITB-EPD Programme Procedure) during manufacturing plant audit that is a part of ITB-EPD Programme.

Selecting data / background data:

As a rule, specific data derived from specific production processes or average data derived from specific production processes shall be the first choice as a basis for calculating ITB-EPD. In addition, the following rules apply:

- An ITB-EPD describing an average product shall be calculated using representative average data on the products declared by the EPD. Preferred is weighted average.

- An ITB-EPD describing a specific product shall be calculated using specific data for at least the processes on which the producer of the specific product has an influence over. Generic data may be used for the processes which the producer cannot influence, e.g. processes dealing with the production of input commodities such as raw material extraction or electricity generation, often referred to as upstream data.

- A specific ITB-EPD covering all life cycle stages (cradle-to-grave) may be calculated using generic data for some downstream processes, e.g. waste proceesing or incineration.

- The additional technical information for the development of scenarios of the building's life cycle stages shall be specific or specific average information, when an average product is declared.

- Documentation of technological, geographical and time related representativity for generic data shall be provided in the technical report.

3.2.5 Life cycle stages declared

An ITB-EPD shall contain information on life cycle modules covered. All construction products shall declare modules A1-A3, Modules C1-C4 and Module D unless they are exempt in which case they shall declare A1-A3 cradle-gate as a minimum or cradle to gate with options. For exemption rules see below EN 15804+A2 text below:

"Only products which fulfil all three of the conditions below shall be permitted to be exempt from the requirement:

- the product or material is physically integrated with other products during installation so they cannot be physically separated from them at end of life,
- the product or material is no longer identifiable at end of life as a result of a physical or chemical transformation process,
- the product or material does not contain biogenic carbon (less then 1% of mass imput)

Note: This means any product containing biogenic carbon cannot omit the declaration of modules C1–C4 and module D."

LCA based information in an ITB-EPD may cover:

- cradle to gate with modules C1-C4 and module D (A1-A3, C and D). These stages are the minimum to be declared for the default type of EPD. They shall be based on a declared unit,
- cradle to gave with options, modules C1-C4, and module D (A1-A3, C, D and additional modules. The additional modules may be A4 and/or A5 and/or B1-B7). This type of EPD shall be based on a functional unit or declared unit. If B-modules and use scenarios are not declared the EPD shall be based on a declared unit,
- cradle to grave and module D (A,B, C and D). This declaration shall be based on a functional unit or declared unit,
- cradle to gate (A1-A3). These stages are the minimum to be declared for all construction products that are exempt from declaring modules C and D and shall be based on a declared unit. This type of EPD is not allowed for products containing biogenic carbon,
- cradle to gate with options (A1-A3 and additional modules. The additional modules may be A4 and/or A5). This type of EPD shall be based on a functional unit or declared unit. This type of EPD is not allowed for products containing biogenic carbon.

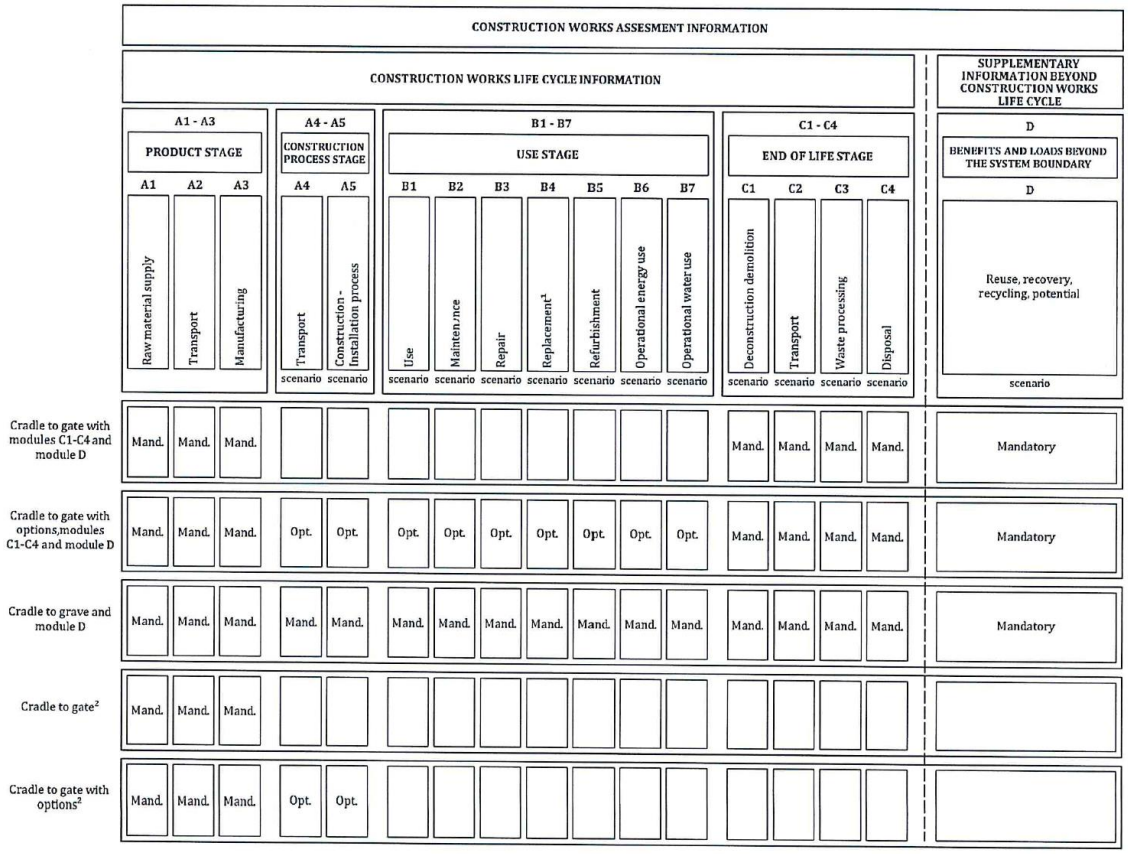

Figure 1 – Types of EPD with respect to life cycle stages covered and life cycle stages and modules for the construction works assessment, adapted from PN EN 15804+A2

3.2.6 System boundaries/limits

LCA is conducted by defining product system as models describing the key elements of physical systems. The system boundary defines the unit processes to be included in the system model.

The manufacturing scheme/diagram shall be included in ITB EPD (or detailed description is provided in EPD).

The information of EPD geographical representativeness shall be included in ITB EPD.

EPD describing an average product shall be calculated using representative average data of the products declared by the EPD and justified.

The system limits of ITB EPD follow the modular structure of PN EN 15804.

The environmental information of EPD shall be subdivided into the information module groups A1-A3, A4-A5, B1-B5, B6-B7, C1-C4 and module D.

The information of modules for EPD shall be included. Information modules within any of the life cycle stages are communicated depending on the type of EPD. They include in EPD results impacts and aspects related to losses in the module in which the losses occur (i.e. production, transport, and waste processing and disposal of the lost waste products and materials). In the introduction to the system boundaries it should also be mentioned:

- omissions of life cycle stages, processes or data requests, should be described,

- assumptions as regard to a power generation, including reference to the year in question,

- offsetting methods for possible CO_2 certificates.

Modules used for EPD are:

A1-A3 – Product stage, information modules. The product stage includes:

- A1, Raw material extraction and processing, processing of secondary material input.

- A2, Transport to the manufacturer.

- A3, Manufacturing.

Module A1, A2 and A3 may be declared as one aggregated module A1-A3.

A4-A5 – Construction process stage, information modules. The construction process stage includes:

- A4, Transportation from the production gate to the construction site.

- A4-A5 – Storage of products, including the provision of heating, cooling, humidity, control, etc.

- A4-A5 – Wastage of the construction products (additional production processes to compensate for the loss of wastage of products).

- A4-A5 – Waste processing of the waste from product packaging and product wastage during the construction process up to the end-of-waste state or disposal of final residues.

- A5, Installation of the product into the building including manufacture and transportation of ancillary material and any energy or water required for installation or operation of the construction site. It also includes on-site operations to the product.

This module also includes on-site operations to the product including provision of all materials, products and energy, as well as waste processing up to the end-of-waste state or disposal of final residues during the construction process stage.

In those modules information about all impacts and aspects related to any losses during this construction process stage should be provided.

In case of a product sold as a system: e.g. as a package including the installation materials, then the entire production of all components and product residues that might occur in A5 are to be declared in A1-A3. The transport of the system to the site is to be declared in A4. The installation inclusive waste treatment is to be declared in A5.

B1-B5, Use stage, information modules related to the building fabric. For declaration with B and C modules detailed product use scenario shall be included.

For products using electricity, this module is obligatory. These information modules include provision and transport of all materials, products, as well as energy and water provisions, waste processing up to the end-of-waste state or disposal of final residues during this part of the use stage. The use stage, related to the building fabric includes:

- B1, Use or application of the installed product – covers environmental aspects and impacts, arising from components of the building and construction works during their normal (i.e. anticipated) use, which are assigned to Module B1.

- B2, Maintenance – These module covers the combination of all planned technical and associated administrative actions during the service life to maintain the product installed in a building, in a construction works or its parts in a state in which it can perform its required functional and technical performance, as well as preserve the aesthetic qualities of the product. This will include preventative and regular maintenance activity such as cleaning, and the planned technical service, replacement of worn, damaged or degraded parts. Water and energy usage required for cleaning, as part of maintenance shall be included in this module, and not in Modules B6 and B7. The boundary of "maintenance" shall include in addition:

    - the production and transportation of any component and ancillary products used for maintenance, including cleaning,

    - transport of any waste from maintenance processes or from maintenance related transportation,

    - the end-of-life processes of any waste from transportation and the maintenance process, including any part of the component and ancillary materials removed.

- B3, Repair – these module covers a combination of all technical and associated administrative actions during the service life associated with corrective, responsive or reactive treatment of a construction product or its parts installed in the building or construction works to return it to an acceptable condition in which it can perform its required functional and technical performance. It also covers the preservation of the aesthetical qualities of the product. Replacement of a broken component or part due to damage should be assigned to "repair", whereas replacement of a whole element due to damage should be assigned to the module "replacement". The boundary for "repair" shall include:

    a) repair processes of the repaired part of a components including:

    1. the production of the repaired part of a component and of ancillary materials,

    2. use of related energy and water,

    3. the production and transport aspects and impacts of any wastage of materials during the repair process.

b) the transportation of the repaired components and ancillary materials, including production aspects and impacts of any wastage of materials during repair related transportation,

c) the-end-of-life processes of any waste from transportation and the repair process, including the parts of the component and ancillary materials removed.

- B4, Replacement – these module covers the combination of all technical and associated administrative actions during the service life associated with the return of a construction product to a condition in which it can perform its required functional or technical performance, by replacement of a whole construction element. Replacement of a broken component or part due to damage should be included as "repair", but replacement of a whole construction element due to damage should be considered as "replacement". The boundary for "Replacement" shall include:

    - the production of the components and of ancillary materials used for replacement,

- replacement process, including related water and energy use and the production aspects and impacts of any waste of materials used during the replacement processes,

- the transportation of the component and ancillary materials used for replacement, including production aspects and impacts of any materials damaged during transportation,

- the end-of-life processes of any losses suffered during transportation and the replacement process, including the components and ancillary materials removed.

- B5, Refurbishment – these module covers the combination of all technical and associated administrative actions during the service life of a product associated with the return of a building or other construction works or their parts to a condition in which it can perform its required functions. These activities cover a concerted programme of maintenance, repair and/or replacement activity, across a significant part or whole section of the building. Restoration activities should be included within refurbishment. The boundaries for refurbishment shall include:

    - the production of the components and ancillary materials used for refurbishment,

    - refurbishment process and related water and energy use including production aspects and impacts of any wastage of materials used during the refurbishment process,

    - the transportation of the component and ancillary materials used for refurbishment, including production aspects and impacts of any losses during transportation,

    - the end-of-life processes of any losses suffered during transportation and the refurbishment, process, including the components and ancillary materials removed.

B6-B7, use stage, information modules related to the operation of the building. The use stage related to the operation of the building includes:

- B6, Energy use to operate building integrated technical systems – the boundary of the module shall include energy use during the operation of the product (the integrated building technical system), together with its associated environmental aspects and impacts including processing and transportation of any waste arising on site from the use of energy. Integrated building technical systems are installed technical equipment supporting operation of a building or construction works. This includes technical systems for heating, cooling, ventilation, lighting, domestic hot water and other systems for sanitation, security, fire safety, internal transport and building automation and control and IT communications. Aspects related to the production, transportation and installation of technical equipment required for supply energy to the building shall be assigned to Modules A1-A5. Energy use during maintenance, repair, replacement or refurbishment activities shall be assigned to Modules B2-B5. Aspects related to the waste processing and final disposal of materials shall be assigned to Modules C1-C4.

- B7, Operational water use by technical building-related systems – The module covers the period from the handover of the building or construction works to when the building is demolished. The boundary of the module “Operational water use by technical building-related systems” shall include water use during the operation of the product (the building integrated technical system), together with its associated environmental aspects and impacts considering the life cycle of water including production and transportation and waste water treatment. Building-integrated technical systems are installed technical equipment to support [the] operation of a building. This includes

technical building systems for cooling, ventilation, humidification, domestic hot water and other systems for sanitation, security, fire safety, internal transport."

C1-C4, End-of-life stage, information modules. The end-of-life stage includes:

- C1, Deconstruction, including dismantling or demolition, of the product from the building, including initial on-site sorting of the materials.

- C2, Transportation of the discarded product as part of the waste processing, e.g. to a recycling site and transportation of waste e.g. to final disposal.

- C3, waste processing e.g. collection of waste fractions from the deconstruction and waste processing of material flows intended for reuse, recycling and energy recovery. Waste processing shall be modelled and the elementary flows shall be included in the inventory. Materials for energy recovery are identified based on the efficiency of energy recovery with a rate higher than 60% without prejudice to exiting legislation. Materials from which energy is recovered with an efficiency rate below 60% are not considered materials for energy recovery.

- C4, waste disposal including physical pre-treatment and management of the disposal site.

Materials from which energy is recovered with an efficiency rate below 60% are not considered materials for energy recovery. Loads (e.g. emissions) from waste disposal in Module C4 are considered part of the product system under study, according to the "polluter pays principle". If however, this process generates energy such as heat and power from waste incineration or landfill the potential benefits from utilization of such energy in the next product system are assigned

D, Benefits and loads beyond the system boundary, information module.

Information module D (obligatory for each construction product) aims at transparency for the environmental benefits or loads resulting from reusable products, recyclable materials and/or useful energy carriers leaving and product system e.g. as secondary materials or fuels. Module D includes: reuse, recovery and/or recycling potentials, expressed as net impacts and benefits. Module D can be declared only for cradle to grave declaration. During the end-of-life stage of the product or the building, all output from dismantling, deconstruction or demolition of the building, from maintenance, repair, replacement or refurbishing processes, all debris, all construction products, materials or construction elements etc. leaving the building, are at first considered as waste. This output however reaches the end-of-waste state when it complies with all of the following criteria:

- the recovered material, product or construction element is commonly used for specific purposes (based on existing statistics or literature);

- a market or demand, identified by a positive economic value, exists for such a recovered material, product or construction element;

- the recovered material, product or construction element fulfils the technical requirements for the specific purposes and meets the existing legislation and standards applicable to products;

- the use of the recovered material, product or construction element will not lead to overall adverse environmental or human health impacts

The criterion for "overall adverse environmental or human health impacts" shall refer to the limit values for pollutants set by regulations in place at the time of assessment and where necessary shall take into account adverse environmental effects. The presence of any

hazardous substances exceeding these limits in the waste or showing one or more properties as listed in existing applicable legislation, e.g. in the European Waste Framework Directive, prevents the waste from reaching the end-of-waste state. The end-of-life system boundary of the construction product system to module D is set where outputs, i.e. secondary materials or fuels, have reached the “end-of-waste” state (see PN EN 15804, section 6.4.3.3).

3.2.7 Criteria for the exclusion of inputs and outputs

Inputs and outputs shall be declared (description, diagram or scheme) in ITB EPD. All cut-offs (especially in A3 module) shall be declared and optionally justified. Criteria for the exclusion of inputs and outputs (cut-off rules) in LCA and information modules and any additional information shall be declared. Any application of the criteria for the exclusion of inputs and outputs shall be documented. The following procedure shall be followed for the exclusion of inputs and outputs:

- All inputs and outputs to a system process shall be included in the calculation. Data gaps may be filled by conservative assumptions with average or generic data. Any assumptions for such choices shall be documented; Estimation form generic data shall be presented (for example where there is no emission, emission should be calculated from combustion factors)

- In case of insufficient input data or data gaps for a unit process, the cut-off criteria shall be 1 % of renewable and non-renewable primary energy usage and 1 % of the total mass input of that unit process. The total of neglected input flows per module, e.g. per module A1-A3, A4-A5, B1-B5, B6-B7, C1-C4 and module D shall be a maximum of 5 % of energy usage and mass.

- It is possible to choose fuel emission data based on laboratory tests performed by the manufacturer or based on the national emission factors for energy carriers

- Particular care should be taken to include material and energy flows known to have the potential to cause significant emissions into air and water or soil related to the environmental indicators of this standard. (for example emissions to water form manufacturer without measurement shall be added by estimation).

3.2.8 Data quality

The source of data shall be declared.

LCI data should be collected and verified in accordance to ITB rules (EPD ITB Procedure, see download section) using ITB LCI collection format (see download section).

As a general rule, specific data derived from specific production processes or average data derived from specific production processes shall be the first choice as a basis for calculating an EPD. In addition the following rules apply:

- EPD describing an average product shall be calculated using representative average data of the products declared by EPD (mass weighted average preferred)

- Manufacturing data shall be specific and verified and originate from manufacturing plant

- Generic data may be used for the processes the producer cannot influence e.g. A1 processes dealing with the production of inputs raw material extraction or electricity generation. Note: Guidance for the selection and use of generic data is provided in CEN/TR 15941. Generic data shall be checked for plausibility. Preferred database is Ecoinvent (latest version of data in a given period)

- The additional information for the development of scenarios of the building's life cycle stages shall be specific or specific average information, when an average product is declared;

- Documentation of technological, geographical and time related representativeness for generic data shall be addressed.

- Data collection shall follow the guidance provided in ISO 14044

The quality of the data used to calculate ITB EPD shall be addressed in the project report. In addition the following specific requirements apply for construction products:

- Data shall be as current as possible. Data sets used for calculations shall have been updated within the last 8 years for generic data and within the last maximum 3 years for producer specific data (preffered 2 years);

- Data sets shall be based on 1 year data;

- The time period over which inputs to and outputs from the system shall be accounted for and is 100 years from the year for which the data set is deemed representative.

- The technological coverage shall reflect the physical reality for the declared product or product group;

- Generic data source shall be presented as description of source

- Data sets shall be complete according to the system boundary within the limits set by the criteria for the exclusion of inputs and outputs

- Processes which do not have an influence on the manufacturing process (e.g. procurement of green electricity) can be integrated in the Declaration. For green electricity, this means that the Declaration may not be issued until such a time as procurement takes place and is verified by contract.

- For processes which have an influence on the manufacturing process (e.g. new furnace), data must be available over a certain period of time which provides a representative set of data for the new process. This need not be a full year; 3-4 months often suffice in this case

  Data quality level (as in EN 15804+A2) should be assessed in EPD.

3.2.9 Power Mix

The following rules applies as regards selecting the power mix:

- In Poland, the actual /national "Polish Power Mix" shall be used for electricity based on KOBIZE (for specific year of assessement).

- Outside Poland, the actual "specific country Power Mix" shall be used for electricity (Ecoinvent is preffered or specific data from energy provider may be accepted).

- If "green" power is used, certificates must be available. ITB supervises whether the number of green certificates is maintained in subsequent years of EPD validity under the restruction of withdrawing EPD from the national repository.

  Note: At production facilities in several European countries, the applicable power mixes shall be assessed specifically for each country

3.2.10 Product scenarios

Scenario of ITB EPD product shall be based on technical specification declared by manufacturer. Scenarios are communicated for ITB EPD that declare optional information modules, the additional technical information related to the scenarios underlying these modules are a required part of the information of the declared information modules. Scenarios shall support the calculation of information modules covering processes that deal with any one or all of the life cycle stages of the construction product except for the required modules A1 to A3; scenarios shall support the assessment of the environmental performance of a building in its life cycle stages “construction, use stage, end-of-life” . Scenarios shall be provided only for the environmental assessment. A scenario shall be based on the relevant technical information defined in EN 15804. A scenario shall be realistic and representative of one of the most probable alternatives. Scenarios shall not include processes or procedures that are not in current use or which have not been demonstrated to be practical. If an optional module declares the life cycle, the relevant technical information, e.g. recycling or reuse rates, must be documented in the project report with reference to the respective literary source. The scenario (for specif module like A4-A5, C1-C4 and D) in the form of assumptions should be included in the EPD.

3.2.11 Allocation rules for inputs and emissions

Statement of allocation of the inputs and output emissions shall be included. It can be done as separated point in ITB EPD or in point Assumptions and estimations. Co-product justification for allocation shall be used. Mass allocation is preferred but financial allocation is acceptable.

Btw, allocation shall be avoided as far as possible by dividing the unit process to be allocated into different sub-processes that can be allocated to the co-products and by collecting the input and output data related to these sub-processes. Allocation shall be based on physical properties (e.g. mass, volume) when the difference in revenue from the co-products is low; In all other cases allocation shall be based on economic values; Contributions to the overall revenue of the order of 1% or less is regarded as very low. A difference in revenue of more than 20 % is regarded as high.

The rules for allocation are based on the guidance given in EN ISO 14044. The sum of the allocated inputs and outputs of a unit process shall be equal to the inputs and outputs of the unit process before allocation. This means no double counting or omission of inputs or outputs through allocation is permitted.

If a process can be sub-divided but the respective data is not available, the inputs and outputs of the system under study should be partitioned between its different products or functions in a way which reflects the underlying physical relationships between them, i.e. they shall reflect the way in which the inputs and outputs are changed by quantitative changes in the products or functions delivered by the system.”

As regards allocating plant data to the declared products, this means: Energy carriers used or ancillary materials and consumables in the plant which cannot be allocated to a specific product on the basis of the processes or via a recipe must be allocated by mass (per t). Allocation of plant data to the declared products must be documented. [EN15804, section 6.4.3.2]:

“In the case of joint co-production where the processes cannot be sub-divided, allocation shall respect the main purpose of the processes studied, allocating all relevant products and functions appropriately. The purpose of a plant and therefore of the related processes is generally declared in its permit and should be taken into account. Processes generating a very low contribution to the overall revenue may be neglected. Joint co-product allocation shall be allocated as follows:

- Allocation shall be based on physical properties (e.g. mass, volume) when the difference in revenue from the co-products is low.

- In all other cases, allocation may be based on economic values.

- Material flows carrying specific inherent properties, e.g. energy content, elementary composition (e.g. biogenic carbon content), shall always be allocated reflecting the physical flows, irrespective of the allocation chosen for the processes."

Allocation of multi-input processes:

Various products are processed together within an individual process, e.g. in a waste incineration plant, a bio-power station or a landfill site. Allocation is performed on the basis of physical classification of the material flows. If necessary, the environmental impacts linked with the inputs are distributed depending on how they influence the subsequent production processes.

Allocation procedure for reuse, recycling and recovery, on the basis [EN15804, section 6.4.3.3]:

"The end-of-life system boundary of the construction product system is set where outputs of the system under study, e.g. materials, products or construction elements, have reached the end-of-waste state. Therefore, waste processing of the material flows (e.g. undergoing recovery or recycling processes) during any module of the product system (e.g. during the production stage, use stage or end-of-life stage) are included up to the system boundary of the respective module as defined above. Where relevant […], informative module D declares potential loads and benefits of secondary material, secondary fuel or recovered energy leaving the product system. Module D recognizes the "design for reuse, recycling and recovery" concept for buildings by indicating the potential benefits of avoided future use of primary materials and fuels while taking into account the loads associated with the recycling and recovery processes beyond the system boundary.

Where a secondary material or fuel crosses the system boundary, e.g. at the end-of waste state, and if it substitutes another material or fuel in the following product system, the potential benefits or avoided loads can be calculated based on a specified scenario which is consistent with any other scenario for waste processing and is based on current average technology or practice. If today's average is not available for the quantification of potential benefits or avoided loads, a conservative approach shall be used."

Allocations performed must be described in the project report, at least (if relevant):

- Allocations when using secondary materials as raw materials

- Allocations in the plant (differentiation from other products manufactured in the plant)

- Allocation of multi-input processes if performed during modelling

- Allocations of reuse, recycling and energy recovery

The allocation processes selected must be justified and the allocation factors used must be confirmed by independent sources. Uniform application of the allocation rules must be documented.

3.2.12 End of life allocation

The end of life scenario shall be declared if such a stage of declaration is under assessment. The end-of-life system boundary of the construction product system is set where outputs of the system under study, e.g. materials, products or construction elements, have reached the end-of-waste state (no value status).

Where relevant informative module D declares potential loads and benefits of secondary material, secondary fuel or recovered energy leaving the product system. Where a secondary

material or fuel crosses the system boundary e.g. at the end-of-waste state and if it substitutes another material or fuel in the following product system, the potential benefits or avoided loads can be calculated based on a specified scenario which is consistent with any other scenario for waste processing and is based on current average technology or practice. If today's average is not available for the quantification of potential benefits or avoided loads, a conservative approach shall be used.

In Module D, the impacts of net flows are calculated as follows:

- by adding all output flows of a secondary material or fuel and subtracting all input flows of this secondary material or fuel from each sub-module first (e.g. B1- B5, C1-C4 etc.), then from the modules (e.g. B, C), and finally from the total product system thus arriving at net output flows of secondary material or fuel from the product system,

- by adding the impacts connected to the recycling or recovery processes from beyond the system boundary (after the end-of-waste state) up to the point of functional equivalence where the secondary material or fuel substitutes primary production and subtracting the impacts resulting from the substituted production of the product or substituted generation of energy from primary sources,

- by applying a justified value-correction factor to reflect the difference in functional equivalence where the output flow does not reach the functional equivalence of the substitution process.

In module D substitution effects are only calculated for the resulting net output flow.

3.2.13 Calculation procedures

The calculation procedures described in En 15804+A2 and EN ISO 14044 shall apply. The same calculation procedures shall be applied consistently throughout the ITB EPD study. When transforming the inputs and outputs of combustible material into inputs and outputs of energy the net calorific value of fuels shall be applied according to scientifically based and accepted values specific to the combustible material.

Use of commercial LCA software is accepted only if all processes taken into consideration (with main input data) are presented in LCA report. If a content of the software used by LCA external consultant is not recognized and accepted by ITB decision LCA result may be not accepted.

3.2.14 Impact assessment

The impact and aspects for ITB EPD are declared based on EN 15804+A2. All indicators are presented. If indicator is not assessed then INA is used.

The impact assessment is carried out for the following impact categories, using characterisation factors applied in last version of PN-EN 15804+A2:2020-03.

3.2.14.1 Description of the unit processes in the project report

The project report must document the modelling of the unit processes on which the Life Cycle Assessment is based in a transparent manner and taking into account the ISO 14025 provisions governing data confidentiality. The documentation can be done in tabular form or as flow charts (e.g. screenshots from Life Cycle Assessment programmes), whereby the following must be clarified:

- Attribution of company data to data sets from Life Cycle Assessment programmes

- Allocation of process data to the (sub-)sections of the life cycle in the Life Cycle Assessment

If several products are declared in a single EPD or if a product is manufactured at several locations, modelling must be described and/or location and the weighing of data sets documented

3.2.14.2 Life Cycle Inventory Analysis and Impact Assessment

The results of the Life Cycle Assessment must be described in the project report in tabular form for all Modules A1 to D. The Life Cycle Inventory Analysis indicators to be declared and the estimated impacts must also be indicated. If individual modules or entire life cycle stages are not declared, the corresponding fields in the table must be marked as “ND” (not declared). If an indicator value has been calculated to be “zero” or if the value of “zero” is plausible for the indicator e.g. these is no activity in the scenario, then “0” is declared for the indicator. The declaration of “-“ is not allowed. If an indicator is declared, it shall be declared in all the chosen modules. If an optional module is declared, all the chosen indicators shall be declared.

3.2.15 Communication formats

The communication format of ITB EPD shall be in accordance with registered ITB (see ITB format in download section) format partly based on EN 15942, *Sustainability of construction works — Environmental product declarations — Communication formats: business to business*.

The following items of general information are required and shall be declared in an EPD.

- the name and address of the manufacturer (contact and web)
- ITB EPD operator data
- ITB EPD number
- the description of the construction product’s use and the functional or declared unit of the construction product to which the data relates
- construction product identification by name and a simple visual representation of the construction product to which the data relates
- a description of the main product components (resources) and or materials
- name of the programme used and the programme operator’s name and address and, if relevant logo and website
- the date the declaration was issued and the 5 year period of validity
- a statement that EPD of construction products may not be comparable
- justification in the case where an EPD is declared as an average performance
- the sites of manufacturer or group of manufacturers or those representing them for whom the EPD is representative
- information on where explanatory material may be obtained
- information on LCA auditor, LCI auditor, Internal verificatior with contact
- demonstration of verification, independent verification of the declaration:

The basis for LCA analysis was EN 15804 and ITB PCR A
Independent verification corresponding to ISO 14025 (subclause 8.1.3.) [x] external [ ] internal
Verification of EPD: title, name LCI audit and input data verification: title name LCA auditor: tile name, Verification of procedures and declaration: title name

In order to support the application of the modular information of an EPD in an environmental building assessment, it is necessary to provide information in a modular way.

The ITB EPD shall specify which EPD-type is declared:

a) cradle to gate with modules C1-C4 and module D (A1-A3, + C1-4 + D),

b) cradle to gate with options, module C1-C4, and module D (A1-A3 + C1-4 + D and additional modules. The additional modules may be one or more selected from A4 to B7),

c) cradle to grave and module D (A + B + C + D),

d) cradle to gate (A1-A3),

e) cradle to gate with options (A1-A3 and additional modules. The additional modules may be A4 and A5).

In some cases, certain modules may not be relevant to the environmental performance of a product. In such cases the irrelevant module shall be declared as “not relevant”. Such a declaration shall not be regarded as an indicator result of zero. The format of ITB EPD declaration shall include LCI basic data for A3 module. The following information on environmental impacts is expressed with the impact category parameters of LCIA using characterisation factors. These parameters are required and shall be included in ITB EPD as follows:

Impact Category	Parameter	Unit (expressed per functional unit or per declared unit)
Climate change – total [a]	Global Warming Potential total (GWP-total)	kg CO_2 eq.
Climate change – fossil	Global Warming Potential fossil fuels (GWP-fossil)	kg CO_2 eq.
Climate change – biogenic	Global Warming Potential biogenic (GWP-biogenic)	kg CO_2 eq.
Climate change – land use and land use change [b]	Global Warming Potential land use and land use change (GWP-luluc)	kg CO_2 eq.
Ozone Depletion	Depletion potential of the stratospheric ozone layer (ODP)	kg CFC 11 eq.
Acidification	Acidification potential, Accumulated Exceedance (AP)	kg H^+ eq.
Eutrophication aquatic freshwater	Eutrophication potential, fraction of nutrients reaching freshwater and compartment (EP-freshwater)	kg P eq.
Eutrophication aquatic marine	Eutrophication potential, fraction of nutrients reaching marine and compartment (EP-marine)	Kg N eq.
Eutrophication terrestrial	Eutrophication potential, Accumulated Exceedance (EP-terrestrial)	Mol N eq.

Photochemical ozone formation	Formation potential of tropospheric ozone (POCP)	kg NMVOC eq.
Depletion of abiotic resources – minerals and metals [c d]	Abiotic depletion potential (ADP-elements) for non-fossil resources	kg Sb eq.
Depletion of abiotic resources – fossil fuels [c]	Abiotic depletion potential (ADP-fossil fuels) for fossil resources	MJ, net calorific value
Water use	Water (user) deprivation potential, deprivation-weighted water consumption (WDP)	m3 world eq. deprived

[a] The total global warming potential (GPW-total) is the sum of:
- GWP-fosill
- GWP-biogenic
- GWP-luluc

[b] It is permitted to omit GWP-luluc ass separate information if its contribution is < 5 % of GWP-total over the declared modules excluding module D.

[c] The abiotic depletion potential is calculated and declared in two different indicators:
- ADP-minerals&metals include all non-renewable, abiotic material resources (i.e. excepting fossil resources);
- ADP-fossil include all fossil resources and includes uranium.

[d] ultimate reserve model of the ADP-minerals&metals model

The following environmental parameters apply data based on the LCI. They describe the use of renewable and non-renewable material resources, renewable and non-renewable primary energy and water. They are required and shall be included in the ITB EPD as follows:

Parameter	Unit(expressed per functional unit or per declared unit)
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ, net calorific value
Use of renewable primary energy resources used as raw materials	MJ, net calorific value
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ, net calorific value
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ, net calorific value
Use of non-renewable primary energy resources used as raw materials	MJ, net calorific value
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ, net calorific value
Use of secondary material	kg
Use of renewable secondary fuels	MJ, net calorific value
Use of non-renewable secondary fuels	MJ, net calorific value
Net use of fresh water	m^3

The parameters describing waste categories and other material flows are output flows derived from LCI. They are required and shall be included in the EPD as follows:

Parameter	Unit(expressed per functional unit or per declared unit)
Hazardous waste disposed	kg
Non-hazardous waste disposed	kg
Radioactive waste disposed	kg

Other environmental information describing output flows:

Parameter	Unit (expressed per functional unit or per declared unit)
Components for re-use	kg
Materials for recycling	kg
Materials for energy recovery	kg
Exported energy	MJ per energy carrier

Additional information on release of dangerous substances to indoor air, soil and water during the use stage can be added/declared (as additional or health info). Emissions to indoor air, according to the horizontal standards on measurement of release of regulated dangerous substances from construction products using harmonised testing methods according to the provisions of the respective Technical Committees for European product standards, when available.

3.2.16 Life Cycle Interpretation

The aggregation factors of the Life Cycle Inventory Analysis and the estimated impact indicators may be interpreted in EPD with reference to the declared unit and specifications essentially influencing the result.

3.2.17 Documentation of additional information

The project report shall include any documentation on additional environmental information declared in the EPD as required in this standard. Such documentation on additional environmental information may include, e.g. as copies or references: laboratory results/measurements for the content declaration, laboratory results/measurements of functional/technical performance, documentation on declared technical information on life cycle stages that have not been considered in the LCA of the construction product and that will be used for the assessment of buildings (e.g. transport distances, energy consumption during use, cleaning cycles etc.), laboratory results/measurements for the declaration of emissions to indoor air, soil and water during the product's use stage.

3.2.18 Documentation for calculating the Reference Service Life (RSL)

If the entire life cycle is declared (Modules A1 to C4 and D as an option), a reference service life (RSL) must be indicated. In all other cases, indication of a reference service life is optional. "RSL information to be declared in an EPD covering the use stage shall be provided by the manufacturer. The RSL shall refer to the declared technical and functional performance of the product within a building. It shall be established in accordance with any specific rules given in European product standards and shall take into account ISO 15686-1, -2, -7 and -8. Where European product standards provide guidance on deriving the RSL, such guidance shall have priority. Information on the product's RSL requires specification of compatible scenarios for the product stage, construction process stage and use stage. RSL is dependent on the properties of the product and reference in-use conditions. These conditions shall be declared together with a RSL and it shall be stated that the RSL applies for the reference.

3.3 Verification and validity of ITB EPD

ITB EBD shall contain statement: The process of verification of ITB EPD is in accordance with EN ISO14025, clause 8 and ISO21930, clause 9. After verification, this EPD is valid for a 5-year-period. EPD does not have to be recalculated after 5 years, if the underlying data have not changed significantly.

ITB EPD is valid for a 5 year period from the date of issue, after which it shall be reviewed and verified. ITB EPD shall only be reassessed and updated as necessary to reflect changes in technology or other circumstances that could alter the content and accuracy of the declaration. ITB EPD does not have to be recalculated after 5 years, if the underlying data has not changed

significantly. The process for verification and establishing the validity of ITB EPD is in accordance with EN ISO 14025 and ISO 21930 (see ITB procedure). Reasonable change in the environmental performance of a product shall be reported and is +/- 10% on any one of the declared parameters of the EPD. Such a change may require an update/validation of the EPD.

EPD ITB includes ITB national certificate of the conformity with EN 15804 and EN ISO14025. ITB as the public and accredited technical assessment orgnization and notified body (CPR) acts as the third-party verification organization.

The ITB-EPD program assumes an audit of input data and confirmation of LCI data from the manufacturer. Verification of LCA and EPD results by an expert. In the case of calculations made by ITB, the system requires verification by an external LCA expert who is on the list of experts of the ITB-EPD system. In the case of calculations made by external auditors or the manufacturer, the leading LCA verification role is played by ITB.

4 References

1. ITB-EPD Program Procedure
2. ITB EPD Verification Format
3. ITB-EPD Indicators Form
4. ISO 14025:2006, Environmental management – Type III environmental declarations – Principles and procedure.
5. ISO 21930:2007, Sustainability in building and construction – Environmental declaration of building products.
6. ISO 14044:2006, Environmental management – Life cycle assessment – Requirements and guidelines.
7. ISO 15686-1:2000, Buildings and constructed assets — Service life planning — Part 1: General principles
8. ISO 15686-8:2008, Buildings and constructed assets – Service life planning – Part 8: Reference service life
9. EN 15804:2012+A2:2019, Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products
10. EN15942:2011, Sustainability of construction

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