# TECHNICAL RULES AND GUIDELINES

VERSION 1.0

Spring 2025

References to the Technical Guidelines of EPD Danmark should be given as:

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Please contact the secretariat for questions, comments and/or feedback.

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REVISION LOG

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# 1 INTRODUCTION

These Technical Rules and Guidelines are the main technical document and together with the General Programme Instructions, they form the basis for the overall administration of the programme and requirements for Environmental Product Declarations (EPDs) published within EPD Danmark.

The Technical Rules and Guidelines are reviewed annually and updated, when necessary, in order to ensure that the document is in accordance with developments in market conditions, LCA (Life Cycle Assessment) methodology, harmonisation and standardization.

Within the present document, 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 terms “may” or “can”, is used to indicate an option that is permissible
- The term ”may not” is used to indicate that something is not allowed.

The newest version of the Technical Rules and Guidelines and General Programme Instructions will always be available on the website of EPD Danmark: www.epddanmark.dk.

## 1.1 VAILDITY

These Technical Rules and Guidelines shall apply as from April 1st, 2025.

These Technical Rules and Guidelines and coherent General Programme Instructions for EPD Danmark shall apply until the programme operator decides to make a revision.

The Technical Rules and Guidelines have an overlap period with the existing guidance documents within technical matters, as found in ‘EPD Danmarks konsulentkit 2024.2’. The two will coexist for 6 months, meaning that from October 1st, 2025, ‘EPD Danmarks konsulentkit 2024.2’ can no longer be used as reference.

## 1.2 UPDATES IN GUIDELINES AND CUT-OFF DATES FOR IMPLEMENTATION

Changes in calculation principles and similar updates are announced annually through updated Technical Rules and Guidelines. Following this, there will be a transition period of 6 months, after which it is mandatory for a new rule to be implemented in the calculations for an LCA and EPD to be verified. The cut-off date applies to the publication of EPDs, and therefore they shall be verified and sent to EPD Danmark no later than 2 weeks before the cut-off date.

When working on projects with particularly long durations, LCA consultant and experts are required to stay updated on changes in the requirements for EPDs throughout the development process. It is required that EPDs published 6 months after the release of a new version of the Technical Rules and Guidelines meet this version of verification checklists and EPD templates.

Decisions made by the Technical Committee will be implemented in the first upcoming revision of the Technical Rules and Guidelines after the meeting. The decisions from the Technical Committee will continuously be uploaded on the website www.epddanmark.dk, prior to implementation into the Technical Rules and Guidelines.

The revision of Technical Rules and Guidelines follows the publication of ECO Platform documents and other relevant standards[1].

## 1.3 TECHNICAL BASIS FOR PREPARATION OF EPDS

The following documents form the technical basis for the preparation of EPDs in EPD Danmark:

- General Programme Instructions
- Technical Rules and Guidelines of EPD Danmark
- EN15804 - "Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products"
- Complementary PCR (cPCR) documents for specific product categories
- ECO Platform Standards

The hierarchy of documents within EPD Danmark is presented in Figure 1.

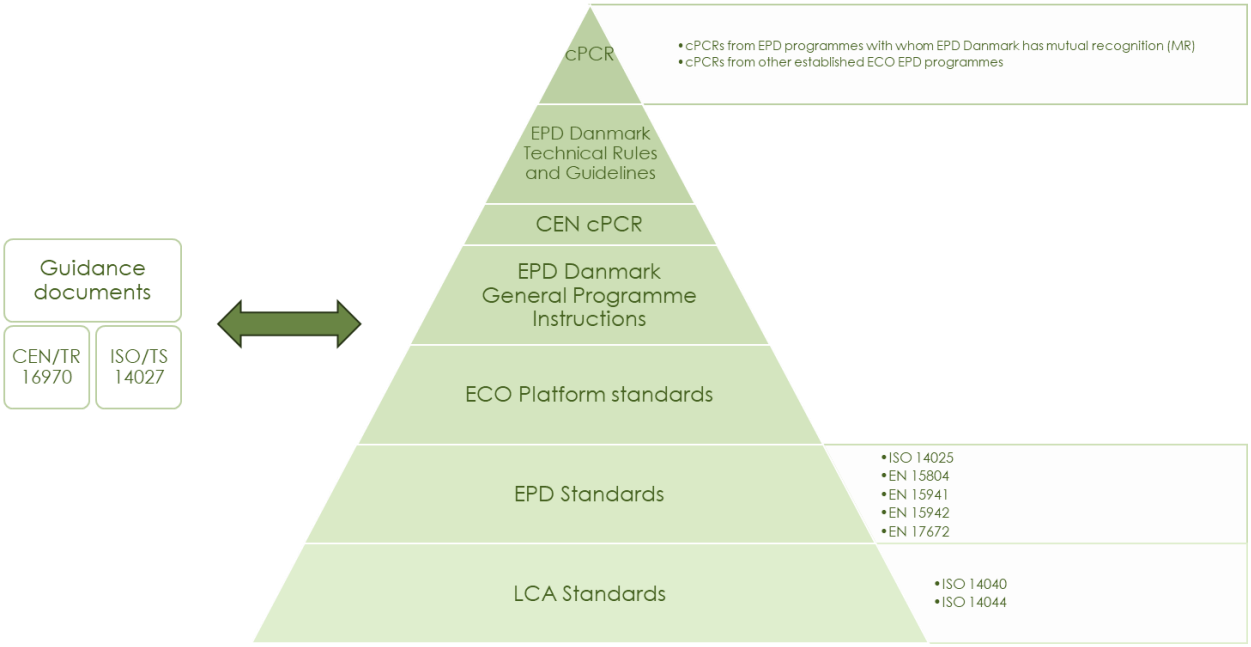


**Figure 1. Hierarchy of documents within EPD Danmark, and associated guidance documents applicable.**

Environmental Product Declarations, developed within the framework of the EPD Danmark programme, shall be in accordance with the technical basis, along with normative references provided throughout the documents. For dated references, only the cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

# 2 PRODUCT CATEGORIES COVERED BY EPD DANMARK

EPD Danmark publishes type III environmental product declarations, as defined by ISO 14025, and developed according to EN 15804, which covers construction products and -services. This also covers EPDs on furniture, as long as it is performed according to EN15804. This also includes services within the construction industry such as soil stabilization, surface treatments of wood (e.g., burning), demolition, or construction (e.g., operation of lifts and machinery). Electronic and electrical products and systems

[1] This means, that new rules decided by ECO Platform and published annually or other updates of relevant standards from the normative basis, will be implemented in a revised Technical Rules and Guidelines by EPD Danmark 6 months later, at the latest.

(EEPS), that are used as part of a construction and hence falls under the scope of EN 15804 are included as well.

To ensure compliance with Construction Products Regulation (EU Construction Products Regulation 2024/3110), products will gradually be excluded from the scope of EPD Danmark as they are harmonized under the regulation.

# 3 DECLARATION TYPES ACCEPTED BY EPD DANMARK

EPD Danmark accepts three overall types of EPDs, defined as:

- Industry EPDs
- Product specific EPDs
- Project specific EPDs

As there is a significant difference between the three types of EPDs, their data requirements and products represented, it is important that EPD developers and users are aware of these differences.

## 3.1 INDUSTRY EPD

An Industry EPD[2] covers multiple manufacturers and thus presents an average of data from a representative sample of the specified industry that is declared. An industry EPD[3] can either

1. declare average for one product, where a representative number of manufacturers (representing the majority of market) declare the same type of product. As the industry EPD is an average of the market dominating manufacturers for the given product, there is no requirements as to the variations on input data or LCIA results.

or

2. declare average of multiple products. The same requirements in regard to representativeness as above applies, however the variation in input data and/or LCIA results for GWP-total between the results of the single different products cannot exceed +/-10% within each life cycle stage[4].

or

3. declare a group of products under a set of 'worst case'- results.

It shall be demonstrated that at least 50% of the market is covered to create an industry EPD. This can be based on data for mass or economy. It is recommended aiming higher to ensure continuity, even if a manufacturer drops out.

If the products vary from manufacturer to manufacturer, the secretariat shall be contacted before the project starts, to approve the product definition.

The EPD shall be based on a weighted average, either economic or mass based. As a starting point, data shall be collected from all included companies, but in some cases, extrapolation can be done based on collected data from similar productions.

An industry EPD shall be registered with and published by EPD Danmark to be valid.

[2] Defined as "more than 1 manufacturer EPD" in EN 15941
[3] Industry EPDs within EPD Danmark covers EPD type and scope 2A (1), 2B (2) and 3 (3), according to table 2 in EN 15941. Type 2C is not allowed within EPD Danmark
[4] Covering A1-A3, A4-A5, B1-B7, C1-C4

## 3.2 PRODUCT EPD

A product specific EPD (product EPD)[5] covers one manufacturer, and can either

1. declare one specific product from one place of production of one manufacturer.

or

2. declare one specific product as an average from several places of production of the same manufacturer.

or

3. declare average of several similar products from one place of production of a manufacturer. The variation among results of the single different products cannot exceed +/-10% within each life cycle stage on the GWP-total indicator.

or

4. declare average of several similar products from several places of production from the same manufacturer. The variation among results of the single different products cannot exceed +/-10% within each life cycle stage on the GWP-total indicator.

or

5. declare a group of products under a set of 'worst case'- results.

The rules for declaring multiple products, averages, and worst-case products can be found in section 4 of these Technical Rules and Guidelines: Grouping/definition of products.

Identical products produced at multiple locations may appear under a single set of average results, even if the results from the individual factories are not within +/-10%. In that case, a set of weighted results by quantities sold shall be declared.

A product specific EPD has to be registered with and published by EPD Danmark to be valid.

## 3.3 PROJECT EPD

A project specific EPD (project EPD) is a variation of a product specific EPD, which is developed for a specific product, from an EPD owner to a specific customer and/or project.

A project EPD, that is developed by an LCA consultant and third party verified by a verifier affiliated to EPD Danmark, can be published with a shorter validity period to ensure that the EPD is not available beyond its relevance. A project EPD developed this way, shall be registered with and published by EPD Danmark to be valid.

If a project EPD is created by the use of an EPD tool[6], the project EPD is considered valid when it refers to a published product EPD and is created and monitored as described in Appendix D of the General Programme Instructions. Such project EPDs do not need to be published in the EPD Danmark database to be valid.

[5] Defined as "Manufacturer specific EPD" in EN 15941. Product EPDs within EPD Danmark covers EPD type and scope 1A (1), 1B (2), 1C (3), 1D (4) and 3 (5) according to table 2 in EN 15941. Type 1E and 1F is not allowed within EPD Danmark

[6] See appendix D, in the General Programme Instructions

# 4 GROUPING/DEFINITION OF PRODUCTS

In EPDs registered with and published through EPD Danmark, results are allowed to be grouped, i.e. represent an average of different products, if they comply with a list of specifications and requirements. The grouping rules vary slightly, depending on whether the EPD is an industry EPD or a product EPD, see 3.1 and 3.2.

It is permitted to declare several products in the same EPD but presented in several data sets. Declaring multiple products in the same EPD using multiple sets of results, i.e. one per product, is not subject to the rules on grouping. However, it is recommended to not declare more than 10 products in one EPD. In certain cases, several products can be specified with the same data set and a number of conversion factors, e.g., at different thicknesses and demonstrable linearity. However, it is required that the products shall have the same declared/functional unit and that the calculations are performed according to the same cPCR to include several products in one EPD.

## 4.1 GROUPING OF PRODUCTS IN PRODUCT EPDS, GENERAL

The general rule for grouping the environmental profiles of product EPDs ("product groups") is that they shall not differ by more than +/-10% within each life cycle stage on the GWP-total indicator, if they are to be reported as one data set. Special rules may be specified in a cPCR, which in that case shall be followed.

Products can be grouped if they meet all the following three criteria:

1. They have the same declared or functional unit
2. They fall under the same cPCR
3. None of the products' GWP-total impact indicators, within each life cycle stage, deviate more than 10% from the declared result.[7]

The declared result can be either a standard product, an average (simple or weighted) or the products can be grouped under one worst-case product or worst-case declaration. The EPD shall state which has been used, and the calculations shall be documented in the project report.

The rules on grouping define which products can be included in one set of results, which constitute either an average or are represented by a worst-case declaration.

**Example 1: Grouping or declaration of multiple products?**

A window manufacturer makes windows in the same format, but in three different colours. The environmental impacts are calculated for all three colours individually. The red one turns out to have +10% the impact of the green one on the core environmental parameter GWP-total (within each or one life cycle stage), and the yellow one, -10% less.

This would be a grouping if it is chosen to average the results and insert one set of results into the EPD.

This would be a declaration of multiple products if three sets of results are inserted into the EPD.

This would be a declaration of different products using conversion factors if only the results of the green one are presented in the EPD, but there is a table below that indicates how to calculate the impact for the red and yellow ones by multiplying by 0,9 and 1,1 respectively. When using conversion factors, linearity/proportionality shall be proven across all declared indicators.

[7] If the deviation is larger, separate data sets shall be specified or, if applicable, worst-case declaration.

### 4.1.1 DEFINITION OF THE BASIS OF CALCULATION OF AVERAGES

As a general rule, the result for the core environmental parameter GWP-total shall not vary by more than +/-10% within any of the declared life cycle stages if a product average is to be presented. It is therefore the sum of A1-A3 and C1-C4, respectively, if only the mandatory modules are declared. If several scenarios have been declared, the deviation rule of +/-10% shall be respected by all scenarios.

### 4.1.2 THE WEIGHTED AND SIMPLE AVERAGE

The weighted average should be used where possible. There may be cases where the simple average is a better approach. This may be, for example, if data on quantities sold are not available, or if there is generally a large variation between the different years.

If a weighted average is given, it should be weighted based on the annual quantities of the different products. The weighting should be based on products sold, either per declared unit or on an economic basis. The average used is calculated from the results for each individual product, and not, for example, the composition of the product.

### 4.1.3 THE WORST-CASE PRODUCT/DECLARATION

If it is not possible to divide the products into a suitable number of groups, a worst-case product can be specified[8]. The worst-case declaration shall represent a set of results, that is worst case for all environmental indicators (both core and additional), for the declared group of products. This entails that, in the case of declaring a 'worst case product', all environmental indicators shall be assessed, not only GWP-total. Declared indicators for resources, output and waste, are defined by the worst-case product according to the GWP-total indicator.

When a mixed worst-case declaration is used, the following applies:

- The 'worst' result within all environmental indicators is used
- Resource, output and waste indicators declared are defined by the 'worst' product acc. GWP-tot
- The result for the same product within each indicator is used. This means that when the sum of A-C for ODP is highest for 'product x', the result in A1-A3, B1, B2, B3 etc. from 'product x' is used.
- All GWP indicators shall come from the same product, based on GWP-total.
- The EPD shall include a disclaimer stating that "due to the calculation of the worst-case product, correlations normally existing between indicators can be affected"

Whether to choose a worst-case product or to divide into additional product groups depends on how precise the EPD owner wants their results to be. Mixed worst-case declarations should only be used when other options cannot be used.

### 4.1.4 USING CONVERSION FACTORS TO REPRESENT SEVERAL PRODUCTS

Products that are similar in composition, production method, etc., but are sold in different formats, can often be considered as one, by either choosing the declared unit wisely or by incorporating conversion factors in the EPD. As a starting point, proportionality shall always be substantiated, either through logical argumentation or through calculations. The verifier may, at any time, request an investigation of proportionality, often consisting of calculation and linear analysis of all declared indicators for the largest and smallest product, respectively, as well as the specified example product/average product, or an elaboration of why proportionality can be assumed.

[8] If necessary, defined as a 'mixed worst-case declaration', where the worst result within the group of products for each indicator is specified.

### 4.1.5 EXAMPLES

#### 4.1.5.1 SIMILAR PRODUCTS IN DIFFERENT FORMATS

**Example 2:**
A manufacturer makes chipboard in different formats, but all of the same thickness. The declared unit is 1m$^2$.

A logical conclusion can be drawn that the load is the same whether a 2m x 2m or 4m x4m board is sold. Therefore, all products may be declared under the same set of results.

**Example 3:**
A manufacturer of EPS insulation markets its products in 5 different thicknesses, but otherwise the product consists of the same material. The declared unit is 1 m$^2$.

In this case, the products cannot be declared under the same data set, as the declared unit is 1 m$^2$. On the other hand, it can be logically argued that the environmental impacts are proportional to the declared unit, which is why conversion factors may be declared for all five formats.

**Example 4:**
A manufacturer of EPS insulation markets its products in 5 different thicknesses and two different densities, but otherwise the product consists of the same material. The declared unit is 1 m$^2$.

In this case, it can also be logically argued that the environmental impacts are proportional to the declared unit, which is why conversion factors may be stated for all ten formats.

#### 4.1.5.2 SIMILAR PRODUCTS OF THE SAME MATERIALS, BUT DIFFERENT FORMATS AND COMPOSITIONS

Products that consist of the same materials and production method but are sold in different formats[9], in a way that the mutual relationship between the different subcomponents is varied, cannot in the same way be considered the same product through logical inferences, and a calculation is therefore necessary.

**Example 5:**
A manufacturer of acoustic panels has a range of products consisting of a steel frame and a bio-based panel material. The manufacturer wants to declare the product per m$^2$.

The consultant starts by calculating the GWP total-of the largest and smallest panel. If the results are within +/-10% of the weighted average, all products can be declared under the same set of results. If not, the products can either be split into smaller categories or they may be defined under a worst-case product.

**Example 6:**
A window manufacturer has EPDs made on windows with aluminium and wooden frames, respectively. The declared unit is 1 m$^2$.

Since the ratio between glass and frame material changes as the window gets larger, it will not be possible to assume a proportionality that allows a conversion factor to be used.

Since there is a cPCR published by CEN, which defines that a window shall be declared per m$^2$ and is based on a standard window size, this shall be followed.

[9] i.e. dimensions and compositions of subcomponents

#### 4.1.5.3 PRODUCTS WITH MANY COMPONENTS AND COMBINATIONS

Some building products consist of a large number of smaller components. These can include fittings, kitchen equipment, ventilation- or hot water systems. It may sometimes be difficult to predict how GWP-total will react to changes in the product, and it may be challenging to group the products or define a 'worst case product' without calculating all conceivable products and combinations.

Therefore, a set of environmental results shall be calculated for all individual products, or at least a sufficient sample to determine how the products can be grouped according to the description in 4.1.1

**Example 8:**

A manufacturer produces heat exchangers consisting of many combinations of smaller units, such as copper pipes and electronic components. It is therefore not possible to make logical conclusions about the relationship between the results for the different exchangers.

The manufacturer shall first divide the products into product groups based on function, size or other relevant factors. From this, it is possible to divide the 160 products into 20 groups. The manufacturer begins by examining product groups A, B, and C. Simple averages are used in the calculations. The declared modules are A1-A3, B1-B7, C1-C4, and D.
The consultant begins by calculating the total GWP for all the individual products. Then the consultant determines whether the products can be grouped. Therefore, GWP for A1-A3, B1-B7, and C1-C4, are summed up respectively.
For product group A, the consultant examines which values are the highest and lowest in the group. It is then checked whether the highest value deviates more than 10% from the average. The results show that the highest calculated value is within 10% of the average, and in this case, it is therefore possible to declare all products under the same set of results.

In group B, the products cannot be grouped as an average product, and to avoid further subdivision, it is decided to present group B under a worst-case product. Therefore, all environmental indicators for all products are calculated and summed across all declared modules, except for D. These are analysed by identifying the highest and lowest values for each indicator, e.g., the total GWP sum for A1 to A3, B1 to B7, and C1 to C4. The worst-case value for all environmental indicators (i.e., the highest or lowest, depending on the characteristic of the indicator) turns out to belong to one and the same product. This means they can be grouped under one worst-case product, a 'reference worst case.'

For Group C, the goal is also to represent the group under one worst-case result. However, for this group, there is no clear worst-case product. Instead, the possibility of using a 'mixed worst case declaration' is utilized.
When a mixed worst-case declaration is applied, the following applies:

- The 'worst' result for ALL environmental indicators is used. Indicators for resources, output and waste are ‘selected’ by the GWP-total indicator.
- The result for the same product is used within each indicator. This means that if the sum of A-C for ODP is highest for product C16, then the result from A1-A3, B1, B2, B3, etc., from C16 is used.
- All GWP indicators shall come from the same product, defined by GWP-total

The results thus become a mixture, where GWP-total, GWP-biogenic, GWP-fossil, and GWP-luluc come from product C3, ODP from C16, ADPf from C19, EET from C3, etc.

#### 4.1.6 SPECIAL CONDITIONS FOR GROUPING IN PRODUCT EPDS

##### 4.1.6.1 SPECIAL CONDITIONS FOR SAME PRODUCT IN DIFFERENT PACKAGING

If a product, e.g. a paint product, is sold in different packaging and packaging sizes, and this is found to affect the grouping of products, it is permitted to calculate an average packaging. The average packaging is based on the mass of the packaging. Packaging cannot cause similar products to not be grouped.

##### 4.1.6.2 SPECIAL CONDITIONS FOR +/-10% AND 'CONSERVATIVE APPROACH'

The grouping of products is defined as '+/- 10%'. However, EPD Danmark does in practice allow a product to perform better than 10% from the declared weighted average. This is because it will be a 'conservative approach'.

##### 4.1.6.3 SPECIAL CONDITIONS FOR MULTIPLE PRODUCTION SITES

To be considered as one specific product, it shall be marketed as the same product, i.e. under the same name, item number and appearance, and not otherwise identifiable as different products by the downstream consumer.

### 4.2 SPECIAL CONDITIONS FOR INDUSTRY EPDS

Since differences between manufacturers in themselves may give rise to variations greater than 10% and one cannot speak of one product with the same article number or other fixed common denominators, industry EPDs are exempt from this rule. The definition of a product or product group, on the other hand, shall be done on a qualitative basis and shall be approved by EPD Danmark before work begins.

## 5 METHOD SELECTION AND USE OF CPCR

All EPDs within EPD Danmark shall always comply with the requirements of EN 15804. Within the framework of EPD Danmark, the LCA approach of EN 15804 is interpreted as an attributional LCA method, with the exception of module D, which introduces an element of system expansion. This entails the following requirements for data and handling of allocation issues.

EPDs registered with and published through EPD Danmark shall use the latest JRC-released characterization factors compliant with EN 15804+A2[10]. Currently, this is EF 3.1. The applied characterization factor version shall be declared in the EPD. The information can typically be found in the documentation for the calculation software.

Data used for and in the development of EPDs within EPD Danmark shall comply with the following requirements:

- Shall apply the cut-off (100:0) LCA methodology
- Specific or average data shall be used.
- Marginal data is not allowed.

### 5.1 HANDLING ALLOCATION ISSUES

Allocation issues for and in the development of EPDs within EPD Danmark shall comply with the following requirements:

- If a unit process cannot be divided into smaller subprocesses, allocation shall be used.
- System expansion beyond the boundaries set by the core PCR (EN 15804) and relevant complementary PCR (cPCR), is not allowed.
- "Substitution" or assigning "credits" for avoided environmental impacts shall not be used as a solution to allocation issues.

[10] Accepting a one-year transition period, allowing for LCA tools to implement updates

## 5.2 USE OF CPCR

EPD Danmark works with two types of PCR-documents:

A. Core PCR: EN 15804 - ”Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products”

B. Complementary PCR (cPCR) documents for product categories

All EPDs published through EPD Danmark shall comply with the requirements in EN 15804. In addition, the following types of cPCRs are accepted within EPD Danmark, listed in a prioritised order:

- CEN cPCR documents
- cPCRs from other EPD programmes with whom EPD Danmark has a mutual recognition (MR) agreement, as long as this is clearly stated in the EPD and as long as it does not conflict with the rules and procedures of EPD Danmark
- Other cPCRs that meet the rules and procedures of EPD Danmark, including cPCRs from other established ECO EPD programmes[11] successfully audited by ECO Platform

If a relevant CEN cPCR exists, it is mandatory to use this in the development of the EPD. It is not mandatory to use a cPCR from MR partners or other cPCRs that meet the rules and procedures of EPD Danmark, but it is recommended to support modelling decisions[12]. Therefore, the verifiers may request a brief explanation of the reason why a relevant cPCR from the MR partners of EPD Danmark has been not used.

A CEN cPCR shall be used in development of EPDs no later than 6 months after the release of the CEN cPCR. However, it is recommended to use a CEN cPCR at any time, even if the LCA study has already been commenced, as it helps ensure the comparability of the EPD with other EPDs for similar products.

# 6 SPECIFIC LCA CALCULATION RULES AND DOCUMENTATION NEEDS

## 6.1 GENERAL

EPDs and the coherent LCA registered with and published through EPD Danmark shall follow the general principles of EN 15804, the requirements described in the General Programme Instructions and these Technical Rules and Guidelines.

## 6.2 SYSTEM BOUNDARY

An EPD registered with and published through EPD Danmark can be one of the types listed in EN 15804+A2, Ch. 5.2. This entails a comprehensive declaration of modules A1-A3, C and D as a minimum requirement, with exceptions mentioned in EN 15804+A2 chapter 5.2.

The following are the minimum requirements, as defined by ECO Platform, unless a CEN cPCR says otherwise:

***A1-A3 modules***

- *For energy[13], the market-based approach as per ISO 14067 and EN 15941 can be calculated, but no other methods of offsetting or insetting are allowed.*
- *Presentation of the energy and material flows as a result of deviating allocation processes.*
- *No declaration of loads and benefits in module D for flows that have been allocated as co-products.*

[11] https://www.eco-platform.org/the-eco-epd-programs.html

[12] The rules and procedures of EPD Danmark as described in the General Programme Instructions and Technical Rules and Guidelines take precedence over any conflicting rules in the cPCR of MR partners, if such is used.

[13] Electricity and biogas, as described in section 6.4 and 6.5

***B modules***

- *B6 (energy consumption) shall be added in the calculation of EPDs of final products which are consuming energy, directly or indirectly[14]. B6 shall be presented separately to let users of the EPD accommodate the calculation when appropriate.*
- *If there is no cPCR available, the EPD programme may provide a justified use scenario to apply for each family of products (or product category) that it covers within its programme, together with the related calculation formula when appropriate. Usually this will be done through a PCR publication.*
- *When an existing regulation applies to the calculation of B6 at the geographical scope that the EPD states it covers, the "justified use scenario" to calculate B6 shall be the more demanding regulation applying to the entire scope.*

***C modules***

- *C4: The degradation of a product's biogenic carbon content in a solid waste disposal site, declared as GWP biogenic, shall be calculated without time limit. Any remaining biogenic carbon is treated as an emission of biogenic $CO_2$ from the technosphere to nature.*

## 6.3 DATA

EPD Danmark has no prescribed preference of databases or data for specified regions. However, the data quality shall always be ensured and follow the prescribed requirements from EN 15804 and EN 15941.

Attention shall be paid, that the LCA software is only calculators. If the desired data is not found in the software's LCA database, data sets shall be searched for in other literature sources. The use or omissions of use of such data, shall be documented in the project report.

### 6.3.1 EPDS AS A DATA INPUT

When modelling an LCA for an EPD, it should always be strived to use as specific input data as possible. Therefore, it might sometimes be relevant and applicable to use published EPDs as input data for another EPD. However, when using EPDs as input data, special attention shall be paid, that:

- The impact indicators used/declared are complying with the newest revision of EN 15804
- EPDs in conflict with current guidelines should not be used. The impact of a discrepancy may be assessed and ignored if of little impact.
- EPDs using Mass Balance Approach, including allocation of electricity or biogas certificates within the same plant, shall not be used.
- EPDs using CF 3.0 can partly be used, if these factors are identical or more conservative than current version. See 6.3.1.1 for details.
- EPDs shall be published by an official ECO Platform Program[15]

The verifier can deny the use of a published EPD as data input, if errors are discovered, that leads to significant errors in environmental indicators of the LCA being calculated.

When using EPDs as a basis for calculation, the EPD owner has a responsibility to inform EPD Danmark of a change in supplier if:

- It is not a conservative approach (i.e., if a "non-conservative" product specific EPD is used), and
- it is assessed (in accordance with the verifier) that the raw material is significant for the environmental profile of the product

[14] "Indirectly" refers to products that store or transport energy, such as cables consuming energy through dissipation/losses, but not, e.g., windows or thermal insulation.
[15] https://www.eco-platform.org/the-eco-epd-programs.html

If the above conditions apply, it shall be assessed whether the change of supplier gives rise to a recalculation or withdrawal of the EPD.

Industry EPDs can and should be used, if they are more specific than generic data. An example is if the product/raw material of the supplier is part of the basis of the data or if the industry EPD is specific to the geographical area/market where the product/raw material is purchased.

#### 6.3.1.1 USE OF EPDS WITHOUT 'ADDITIONAL ENVIRONMENTAL INDICATORS':

Several EPDs do not contain the additional environmental indicators, as these are only mandatory in the project report, and therefore the results are missing when an EPD is used as input. In such a case, this information should be requested from the raw material manufacturer/owner of the EPD which is aimed to be used as input in the current calculations.

If this information cannot be obtained, the indicators shall be calculated using generic values and may be included in the EPD. In practice, this means that the result set is based on two datasets, i.e. an EPD for a specific raw material (core environmental indicators, resource and waste indicators) and a generic dataset for this raw material (additional environmental indicators). It shall be clearly stated in the project report that the results are incomplete and partially based on generic data.

If an EPD using older characterization factors than the current valid one (e.g. EF 3.0 or older), extra attention shall be paid to additional environmental indicators. Opposite to other impact categories, these cannot be considered identical or conservative relative to EF 3.1 and therefore shall be excluded from EPDs based on EF 3.1, though they may be included in the project report. Alternatively, generic data can be used as substitution as described above.

#### 6.3.1.2 OUTPUT AND WASTE FLOW INDICATORS:

When EPDs are used as input data, they will often contain values in these indicators. However, if generic data is used, there may be no values, which creates a distortion when using EPDs as input data. The parameters shall be included if there are specific input data. That is, if EPDs are used as data input.

### 6.3.2 EPDS WITHOUT A FULL PRODUCTION YEAR

An EPD should be based on data for an entire year of production. In some cases, however, there may be new products or other reasons why data for a year cannot be obtained. In that case the EPD may be based on a shorter period on at least 3 months.

It is allowed to use extrapolation from existing products. In such cases, it will be up to the assessment of the verifier whether review of data is required. Examples for this may be:

- If a manufacturer changes a subcontractor with specific data attached, this data may be used immediately.
- If a manufacturer replaces a material, e.g., plastic with wood, and the material can be replaced 1:1, this may be included in the modelling immediately.
- If a EPD owner expands the product portfolio with a similar product, estimates based on existing data may be used.
- If GOs are purchased and will be for the validity of the EPDs

It shall be substantiated in the project report that the model represents the specified product, and that the extrapolation is applicable. It is up to the verifier whether there is sufficient argumentation to use the given data for the calculation. Examples that may require special attention when considering this modelling options are whether the changes results in changes in consumed energy or altered lifespan.

#### 6.3.2.1 REVIEW OF EPDS BASED ON SHORT DATA COLLECTION PERIODS

EPDs that are based on a shorter data collection period, shall be reviewed when data for an entire year is available. If these results differ by more than +/-10%[16] from the original results, the EPD shall be revised with the new values/data. The review can be based on a limited scope of data/data collection, if this can be agreed upon by the verifier. This review of data is the responsibility of the EPD owner.

### 6.3.3 CHANGES IN PRODUCTION CONDITIONS OR COMPOSITION:

Changes in production conditions or product composition that may result in changes of the result of more than +/-10% on any of the declared indicators may result in the need for a recalculation of the results[17].

In the event of changes in production conditions, an initial investigation shall be performed to determine whether the change may have an impact on the result for all environmental impacts. Since the calculation is based on the individual life cycle phase, it will generally be sufficient to make the assessment based on the relevant modules, often A1-A3. In the event of significant changes in the composition of the product, the modules C1-C4 shall also be considered. The EPD owner is permitted to revise the EPD upon improvements in production if they wish to, but this is not a requirement, as the declaration will be seen as a conservative approach. In the event of significant deterioration of the environmental performance, the EPD shall be either revised or withdrawn.

### 6.3.4 USE OF PROXY DATA

If specific or representative datasets do not exist, proxy data may be applied. Proxy data shall be chosen based on relevance and similarity to the material used in the declared product and shall be supported by a documented rationale in the project report.

## 6.4 MASS BALANCE APPROACH

Mass Balance Approach (MBA), including Biomass Balance Approach (BMB) is not permitted. In MBA, a proportion of the feedstock (with a certain characteristic) in the total mixture is assigned to one of the final products, instead of stating that all products consist of a certain proportion of the material with the specific characteristic. It is also not permitted to use input data where MBA is used, such as EPDs or LCAs for raw materials, where this attributes a higher content of, e.g. biogenic carbon or recycled material than is physically present in the product.

This principle also applies to allocation of energy resources, such as biogas and renewable electricity, at plant level.

The rule in ECO Platform guideline states that:

"*For an entity producing more than one product, pooled energy resources with contractual instruments shall not be virtually allocated to specific products unless a separate energy supply and contract is in place*"[18]

This means that if a manufacturer purchases 10% biogas and 90% natural gas, the manufacturer cannot sell 10% of the products as a 'greener' version of the original product. Instead, an average of 10% biogas and 90% biogas shall be calculated for all products from this site. See Figure 2 and Figure 3 for an illustration.

[16] within any of the declared indicators
[17] Changes in new versions of background data published within the validity period of the EPD does not require update of the EPD.
[18] ECO Platform LCA calculation rules https://www.eco-platform.org/our-documents.html

If a manufacturer has several sites, it is possible to purchase GOs for one site and calculate an EPD with a 100% renewable energy source from this, and an EPD without purchased GOs for the other sites. In this case, the energy shall be purchased through two separate contracts. See Figure 4 for an illustration.


Figure 2. If a manufacturer purchases 10% biogas and 90% natural gas, the manufacturer cannot sell 10% of the products as a 'greener' version of the original product

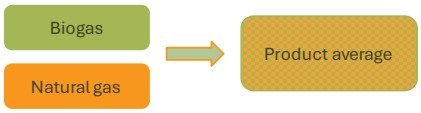


Figure 3. An average of 10% biogas and 90% biogas shall be calculated for all products of the specific production site

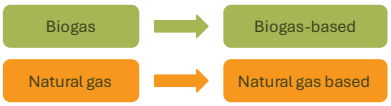


Figure 4. A manufacturer may, if it is possible to purchase GOs for one site, calculate an EPD with a 100% renewable energy source from this specific site, and an EPD without purchased GOs for the other sites

## 6.5 MODELING OF ENERGY CONSUMPTION

### 6.5.1 GENERAL

EPD Danmark accepts the use of Guarantees of origin (GOs) covering electricity and biogas certificates. To reduce double counting, all EPDs registered with and published through EPD Danmark shall follow the rules with respect to electricity generation using the market-based approach, particularly the requirements regarding registries and contractual instruments. The same requirement applies when using biogas certificates.

#### 6.5.1.1 A1-A3

**Foreground data:**

Specific data for energy production shall always be used when available.

- This means that if renewable electricity is used in the production, the electricity shall be modelled as this specific power source (If, for example, 100% Danish wind power is stated, a data set for wind power is used. If it is a mix of several energy sources, that mix shall be modelled). Similar applies to biogas.
- If certified renewable electricity or biogas is not used, the manufacturers consumption shall be modelled as the residual mix.

**Background data:**

- Shall be calculated as far as possible based on the residual mix
- Since background data is most often calculated on the consumption mix (grid mix), this is also accepted, if this is clearly explained in the project report, and no dataset with a residual mix is available.

#### 6.5.1.2 OTHER MODULES

The consumption mix is typically corresponding to "national production + import – export" and shall be used for any modules in addition to modules A1-A3 (i.e. the factory gate), for which GOs are not used (see notes below).

*Note 1: The factory gate can sometimes also include A4 and A5 (e.g., ready-mix concrete).*

*Note 2: Only if the EPD owner has control over a particular process in any of the B-modules and/or C-modules (which may for example be the case for construction services or take back recycling systems) may the production of electricity used in these processes be modelled with GOs and residual mix.*

### 6.5.2 EMISSION FACTORS OF THE ENERGY MIX

The EPD shall include an indication of the type of electricity used in the LCA modelling[19].

If the electricity accounts for more than 30 % of the total energy use in stage A1-A3, the GWP-total of the electricity in kg $CO_2$e/kWh used in the foreground processes and any other processes in the direct control of the manufacturer, shall be provided in the EPD.

For biogas, the same rules apply for declaration of GWP total in kg $CO_2$e/MJ. However, this is not required to be presented in the EPD but only in the project report.

### 6.5.3 GUARANTEE OF ORIGIN – CERTIFICATES

It shall be stated in the EPD, if certificates (GOs) are used, and these shall be documented to EPD Danmark annually throughout the entire validity of the EPD.

The documentation for renewable energy shall include the following:

- Energy provider
- Manufacturer (purchaser of the energy)
- Electricity or gas mix, or the specific production method (attributes of energy)
- Energy amounts
- Time periods for issuance and validity of GOs
- Reference to the system of GO operated under

Additional information that should be declared/documented are:

- The address of the power plant (for electricity)
- Tracking numbers[20]
- Information on (direct) coupling[21] (yes/no)

If the additional information is not available, justification shall be provided.

Unlike electricity, the biogas market is less standardized, and its integration into the gas grid differs due to variations in methane and ethane content. GOs for biogas must be issued based on energy content (kWh or MJ), as heating value varies, ensuring accurate representation. Additionally, the geographical considerations and the origin of the biogas shall be justified in the project report with regards to connection to the same network, to confirm the physical flow of biogas.

Certificates shall be approved by the verifier for the production year (or less, if new agreement is in place). EPD Danmark will contact the EPD owner annually to acquire documentation that they have purchased the electricity or biogas on which the EPD is based. If the purchases are not maintained, the EPD is withdrawn.

If there are no certificates for a specific origin of the energy, but the energy supplier purchases a mix of 'what is available that year', data shall be obtained for what the mix is for the modelling year. This means

[19] E.g. how the electricity or biogas used has been modelled, e.g. using a residual mix, electricity backed up by a contractual instrument, onsite generation, direct connection etc.

[20] Tracking numbers for energy certificates are typically auto-deleted in national systems, with energy providers sometimes offering Excel-based verification of energy amounts versus certificates. While 100% renewable products are commonly deleted from registries, mixed energy products might not be. National energy control bodies manage these digitalized systems, where the "book and claim" process automatically match and cancels energy amounts (MWh by MWh) in the AIB system. Documentation like Excel sheets or tracking proof should only be requested by verifiers when there's reasonable doubt about the provided documentation from energy providers or certification bodies. When tracking isn't possible, proper justification should be documented.

[21] Concept (direct) coupling: The linkage certifies that the GO is linked to the underlying electricity and that the energy producer (plant) actually delivers it together with the electricity to the energy provider.

an average mix of renewable energy, based on the purchase of GO by the specific energy supplier, covering the modelling year.

Further guidelines for the documentation of renewable energy and requirements for the registration systems are found in EN 15941.

#### 6.5.3.1 Certificates Outside the EU and Countries Without a Central Register

Not all EU/EEA countries have a central register according to 2018/2001/EC, and therefore there is no residual mix. Consequently, the consumption/grid mix will be equal to the residual mix and may be used in the calculation.

For countries not subjected to 2018/2001/EC, other relevant certificates may be used, along with documentation that similar systems exist in the respective country or area. The documentation package shall be easily available to the verifier, meaning it shall be in a language the verifier can read.

By 'similar systems,' it is meant that the energy certificates are managed by a central register, which also ensures that the cancelled certificates are withdrawn from the mix. Contractual instruments like Guarantees of Origin can only function with a reliable and transparent "book and claim" register to avoid double counting.

EPD Danmark follows the definition of a "reliable and transparent book and claim register" of ECO Platform: "*The register shall be operated by an independent organization and shall cover ONE geographical region and be the only one there. Within this clearly defined geographical (not necessarily national) region, energy producers should only be allowed to declare their produced kWh in the mentioned register. It should not be possible for the energy producer to declare their energy in multiple registers, thereby 'double counting' the energy*." [22]

### 6.5.4 Power Purchase Agreements/Private Solar Panels

If the company invests in renewable energy through either a Power Purchase Agreement (PPA) or by installing private solar panels, special conditions may apply to the documentation.

With a PPA, GOs will often be created, which are cancelled when they are consumed by the manufacturer themselves or they can be resold, if they are not part of the consumption of the manufacturer. Therefore, special attention shall be paid to investigate whether certificates can be easily obtained or whether additional documentation is needed to ensure that the electricity does not appear as renewable electricity in two places.

If a manufacturer installs their own solar panels but is still supplied with power at low production from the panels, and possibly is selling electricity at high production, the specific accounts shall be described and documented. If the power that is sold is not cancelled, and thus can be resold as GOs, then the manufacturer is not allowed to benefit from these in the modelling of their LCA.

The manufacturer can model their entire consumption as renewable electricity if:

- Certificates are created which are immediately cancelled.

or

- The purchased power is traded as renewable (i.e. GOs have been cancelled for this quantity)

or

- It can be ensured in another way that the exported power does not appear as renewable power mixes elsewhere.

[22] ECO Platform LCA calculation rules (https://www.eco-platform.org/our-documents.html)

## 6.6 WASTE FROM A1-A3

The 'polluter pays principle' shall be followed when modelling waste generated by the studied system. This means that the waste processing shall be assigned to the product system that generates the waste until the end-of-waste stage is reached. When the EoW stage is reached, EN 15804 6.3.5.2 applies, determining that flows leaving the system at the EoW boundary of the product stage shall be allocated as co-products (described in EN 15804 6.4.3.2), if possible.

For simplicity, it is allowed to assume a conservative approach, where all burdens related to the co-products are attributed to the studied system. This is comparable to assuming no or insignificant value of the studied 'co-products' (formerly considered waste) in the economic allocation of the processes. Alternative allocation methods (physical partitioning or allocation, system expansion) are not permitted for low-value co-products, such as those used in cement and concrete production, including granulated blast-furnace slag from steel production, fly ash and artificial gypsum from coal-fired electricity generation, silica fume from silicon metal and ferro-silicon alloys production, and aluminium-oxide materials from aluminium.

If the same materials are used as input to another system, the flows shall be allocated a share of the burden according to their economic value, regardless of the assumed conservative approach applied in the former system.

In the calculation rules agreed by ECO Platform, it has been specified that when assessing high-value products like steel or electricity, economic allocation to low-value cement/concrete co-products may be omitted as a conservative approach.

## 6.7 MODELING OF SECONDARY MATERIALS

There shall be consistency between the modelling approach applied when sending recyclable materials out of the system and when using them as raw material in the current system. Secondary materials should therefore be modelled with the impact that has not been attributed to the previous product system where relevant. The modelling should always respect the 'polluter pays' principle as prescribed by EN 15804.

Flows leaving A1-A3 at End-of-Waste (EoW) should be allocated as co-products. Since waste streams often have significantly lower economic value, this means that economic allocation shall be used. This also means that if the same materials enter another product system, they shall be attributed a corresponding impact.

It will often be necessary to base the allocation factors on market prices if the manufacturer using the secondary material cannot account for the economic conditions in the preceding product system. These shall be substantiated with sources in the project report.

A distinction is made between pre-consumer and post-consumer waste. If the secondary material comes from products that are recycled after their service life, they can be included in the calculations without impact, up until the EoW state. Further processing steps to achieve functional equivalence or sufficient relevant state of material, must be accounted for. If, on the other hand, it is waste from a manufacturing company, then an impact shall be attributed to the material when it enters the new product system, according to the approach in EN15804.

In the calculation rules agreed by ECO Platform, it has been specified that economic allocation shall be applied to co-products used in cement and concrete production, such as granulated blast-furnace slag from steel production, fly ash and artificial gypsum from coal-fired electricity generation, silica fume from

silicon metal and ferro-silicon alloys production, and aluminium-oxide materials from aluminium production. This economic allocation is required even for co-products contributing less than 1% to overall revenue, using market prices averaged over time as per ISO 14044 A2:2020.

## 6.8 BIOGENIC CARBON MODELLING

Calculating and declaring the biogenic carbon in both product and packaging in kg C is mandatory, with additional conversion to $CO_2$ equivalents required when biogenic carbon content exceeds 5% mass of product packaging. It shall be assured that the calculated biogenic carbon content, considering other possible sources as well, aligns with the declared biogenic $CO_2$ equivalents in the results of the core environmental impact indicator, GWP-biogenic.

The origin on the bio-based materials should always be ensured and documented in the project report. The verifiers may require additional explanations, if they deem the documentation deficient or doubtful.

When using generic data and/or background databases, the biogenic carbon content may not always balance out. Negative GWP biogenic values (uptake) that cannot be explained or documented shall be set to zero, as undocumented carbon uptake cannot be accepted. Positive GWP biogenic values (emission) may be allowed without explanation, as this reflects a conservative approach, though significant unexplained values shall be further investigated and shall be accounted for in the project report.

The carbon uptake and release associated with the declared product and packaging shall align with the material data provided, requiring adjustments to datasets where necessary. For materials where the biogenic carbon content is central, like wood etc., upstream and downstream GWP biogenic flows shall be balanced and properly documented across the product lifecycle.

Flows from secondary data and background data may be disregarded if they contribute less than 1% to the total GWP indicator.

### 6.8.1 BALANCING OF BIOGENIC CARBON IN THE PRODUCT

There may be situations where biogenic carbon is released in modules that are not declared. Examples of such situations are products that degrade in the B modules. Biogenic carbon shall be balanced over the lifecycle of the product, but the modularity principle, which is a central element in EN 15804, shall also be adhered to.

Moving the biogenic flow from a product that degrades in non-declared B modules, to another module such as C3, is a violation of the modularity principle. If a module is not declared, emissions from this module are not included. This means it cannot be moved to another module, unless specified rules apply[23].

It is not allowed to have a $CO_2$ uptake in a declared module that is not released/balanced within the lifecycle of the product. This is expressed in 5.4.3 of EN15804, which states that delayed emissions or carbon storage for biogenic carbon shall not be accounted for. Thus, the emission shall occur in either one of the other declared modules or in one of the non-declared modules.

If the emission occurs in any of the non-declared modules, the EPD shall clearly state the amount of biogenic carbon that disappears in the omitted module if it causes an imbalance in the biogenic carbon accounting declared. This way, the EPD user has the opportunity to include this in the modules they need to model themselves.

[23] See e.g. the specified rule for declaration of packaging, section 6.8.2

It is recommended to always include modules with significant emissions, to facilitate the use of the EPD.

### 6.8.2 BIOGENIC CARBON IN PACKAGING

If the packaging contains more than 5% biogenic carbon, the uptake of this biogenic carbon as biogenic $CO_2$ in module A3 (or A1-A3 if aggregated) shall be balanced by a corresponding amount of biogenic $CO_2$ emission in module A5. In such case, A5 shall be included.

If A5 cannot be fully included the biogenic carbon in the packaging shall artificially be released as biogenic $CO_2$ in the declared A1-A3 results. If this is done, the EPD shall describe that the A1-A3 results include the "forced balance reporting" of the biogenic $CO_2$ from packaging disposed in module A5, along with the value of $CO_2$ eq. that has been included in A1-A3 but belongs in A5. The reason for not fully including A5 shall be reported in the project report.

If the packaging contains less than 5% biogenic carbon, this "forced balancing" of biogenic carbon may be done directly in module A3 (or A1-A3 if aggregated).

## 6.9 MODELLING OF PALLETS (PACKAGING)

Pallets are a common part of product packaging, but due to its reusability combined with a large biogenic carbon content, modelling of pallets arises a number of questions, which are clarified in this section.

Recycled pallets[24] are often part of the packaging for a product. How the pallet is included in an EPD varies depending on what is being calculated and in which module the calculation/declaration is made. The modelling of pallets shall represent the actual packing of the product on the pallets, not the theoretical packing of a pallet.

**Packaging pallet example**

For the clarification below, the following example is used:

- 100 kg of product is transported on a pallet. The pallet weighs 25 kg.

A EUR pallet weighs 22-25 kg depending on the moisture level and is used about 25 times[25] before it is disposed of[26].

### 6.9.1 PRODUCTION AND DISPOSAL OF THE PALLET

For the production and disposal of the pallet, the product should only be charged with the part that the modelled use cycle represents. 1/25[27] of the pallet can be modelled in production costs and waste management. This interpretation is introduced because it is rarely known whether a EUR pallet is newly produced or used in the 5$^{th}$ or 20th life cycle. The approach streamlines the assumption of number of life cycles for pallets between EPDs, by assuming that for an average year, 1/25 of the pallets used will be of virgin origin, while the others are secondary pallets. Similarly, 1 out of 25 pallets is assumed to be discarded at the end of this life cycle, while the remaining will be reused as packaging in another product system.

For the production and disposal of the pallet, the declared product should only be charged with the part that this use cycle represents. The pallet is produced in A3 and disposed of in A5.

[24] EURO pallets. The rule does not apply to special or disposable pallets.
[25] The number of times may vary, and the source of the assumption/claim shall be cited.
[26] https://environment.ec.europa.eu/system/files/2021-12/Annexes%201%20to%202.pdf
[27] Depending on the weight of the pallet modelled

**Packaging pallet example, continued**

In the example, this can be calculated as $\frac{25\ kg\ pallet}{25\ life\ cycles} = 1\frac{kg\ pallet}{life\ cycle}$

And if it is declared per declared unit, the example would thus have to declare as 0.01 kg pallet per kg product: $\frac{1\frac{kg\ pallet}{life\ cycle}}{100\ kg\ product} = 0.01\frac{\frac{kg\ pallet}{life\ cycle}}{kg\ product}$

### 6.9.2 INHERENT PROPERTIES

Inherent properties for the pallet, e.g. biogenic carbon or energy content, shall be calculated following the physical flow of the pallet, following section 6.4.3 of EN 15804. It is therefore not allowed to allocate any of the carbon in the pallet out of the system, and the inherent properties shall be declared for the total weight of the pallet (per declared or functional unit).

In the calculation of biogenic carbon at the factory gate, the weight of the entire pallet (per declared or functional unit) shall be included. This is due to the fact, that both virgin and secondary pallets enter the system with a calculated biogenic carbon uptake, following the -1/+1 principle. The same principle applies to the calculation of GWP biogenic, when flows of biogenic carbon are leaving or entering the system in any of the declared modules.

### 6.9.3 TRANSPORT OF THE PALLET

In the same way as for the inherent properties, the weight of the entire pallet shall be included in the transport. This means that allocation shall not be made across multiple life cycles. This applies both to the transport of the pallet in A3, but also to the transport of packaging and product in A4. The weight of the pallet is stated per declared or functional unit.

**Packaging pallet example, continued**

In the example, transport of 0.25 kg pallet per kg product (if the declared unit is 1 kg) is modelled.

### 6.9.4 RESOURCE AND WASTE/OUTPUT INDICATORS

Since EUR pallets are pallets used over several life cycles, it is important to pay attention to where the material flows are declared. Besides the placement across life cycle stages and modules and the core environmental impact indicators, the pallet shall also be declared in the resource and waste/output indicators.

**Packaging pallet example, continued**

Since $\frac{1}{25}$ of the pallet is accounted for in production and disposal, it shall be assumed that $\frac{24}{25}$ of the pallet is 'missing' to be accounted for. These $\frac{24}{25}$ of the pallet shall therefore be noted under the category SM (Use of secondary material) for production, and under the category CRU (components for re-use) for disposal in A5.

## 6.10 RULES FOR SPECIFIC PRODUCT CATEGORIES

### 6.10.1 SERVICES

Since the service itself is the declared 'product,' it's execution shall be placed in A3, while any input materials required are placed in A1. This can then be inserted into the relevant module at the building level. If an EPD is made for a demolition service, the EPD shall include the demolition in A1-A3, while this will be included in C1 at the building level.

### 6.10.2 MANDATORY MODULES FOR PRODUCTS USING ENERGY

All B modules are mandatory if an EPD is performed on EEE products[28] or other products using energy in module B6.

#### 6.10.2.1 PRODUCTS USING ENERGY IN MODULE B6 OF THE USE STAGE AND PERMANENTLY INSTALLED INTO BUILDING OR INFRASTRUCTURE

This section outlines specific requirements for EPDs of products that consume energy during module B6 of the use stage, specifically those permanently installed in buildings or infrastructure. Such EPDs shall comply with EN 15804, ECO Platform Standards, and relevant cPCRs. For products using electricity, EN 50693 requirements should be considered when possible. However, EN 50693 is a PCR parallel to EN 15804, and therefore, discrepancies shall be resolved by using the rules defined in EN 15804.

#### 6.10.2.2 OTHER REQUIREMENTS FOR PRODUCTS USING ENERGY IN MODULE B6 OF THE USE STAGE AND PERMANENTLY INSTALLED INTO BUILDING OR INFRASTRUCTURE

**Regulatory perspective**

For EPDs intended for specific local contexts (e.g., country-specific EPDs), calculations shall adhere to whichever regulatory framework is more stringent - local or European. When local regulations are less demanding than European standards, European regulations take precedence. Conversely, if local regulations are more stringent than European ones, local regulations shall be followed, provided this is required by the EPD application.

**B modules**

Module B6 declaration is mandatory for EPDs of products that consume energy during their use stage and are permanently installed in buildings or infrastructure (e.g., cables with energy dissipation losses).

These products shall also declare on maintenance (B2), repair (B3), replacement (B4), and relevant emissions in use (B1) necessary to achieve the stated service life. All relevant processes shall be assigned to appropriate modules with clear descriptions in the EPD.

Technical information for all declared B modules shall be included in the EPD documentation. For products that consume energy during their use stage and are permanently installed in buildings or infrastructure, the EPD shall include a clear description of the technical details used to calculate B6, to let users of the EPD accommodate the calculation when appropriate

### 6.10.3 CARBONATION OF CONCRETE AND OTHER MATERIALS

The estimations of carbonation of concrete shall be carried out according to the formulas presented in EN 16757, which may also be used for other materials with the same chemical properties, but where there is no specific cPCR describing the calculation of carbonation. However, if there is a relevant cPCR for the product that states carbonation shall not be included in the GWP results, it shall not be included in the calculation. In addition to EN 16757, it is also recommended that CEN/TR 17310 is used as a guideline for calculations.

The descriptions in the following section are minor additions and far from sufficient for understanding carbonation calculations.

[28] Electrical and Electronic Equipment

For materials that are crushed and recycled at EoL, carbonation should be divided as follows:

- Carbonation expected to occur during crushing and possibly as part of storage is attributed to C3.
- Carbonation that occurs during storage and is not accounted for in C3 (depending on when it meets EoW) can be included in D.
- Carbonation that occurs after the crushed material is installed in its new life cycle, such as road fill, shall not be included in D.

All assumptions regarding carbonation shall be presented in Table 1, which shall be included in both the project report and the 'LCA Background' section of the EPDs if carbonation is included.

Carbonation shall follow the general rules from EN 15804, including that the consideration period for the system is 100 years for all flows except biogenic GWP and that D includes all processes up to functional equivalence. EPD Danmark interprets 'functional equivalence' as 'technical functional equivalence,' corresponding to where the primary material can be replaced by the secondary material.

Table 1. Table for description of carbonation included in EPD

| |
|---|
| **Total calcium for carbonation ($Ca(OH)_2$ + CaO) per DU** |
| **Total potential $CO_2$ uptake (75% reacted) (kg $CO_2$/DU)** |
| **Calculated $CO_2$ uptake (per module)** |
| **Estimated grain size (per module, if relevant)** |
| **Other relevant assumptions (sitting time in pile, covered/uncovered disposal site, use scenario in B)** |

## 6.11 MODELLING OF SCENARIOS

If or when scenarios are modelled in an EPD, there are a number of specified requirements that shall be met:

- The scenario shall be both realistic and commonly existing
- It shall be substantiated that the infrastructure is established and the system shall be economically viable

As a starting point, it should always be checked whether, for example, end-of-life is defined in a relevant cPCR.

### 6.11.1 DOCUMENTATION OF END OF LIFE (EOL) SCENARIOS

It is crucial for the quality of the EPD, that the scenarios modelled in EoL are implemented and realistic. Therefore, only scenarios that are functional and operational shall be applied. The manufacturer's newly established take-back scheme or a theoretical recycling potential[29] shall not be used, unless proven to meet the requirements for substantiation, as listed in section 6.11.1.1.

#### 6.11.1.1 SUBSTANTIATE THE CLAIM

When substantiating a claim on an EoL scenario, the following options may be viable:

- **Legislation/manufacturer responsibility:** Are there rules for how the product may or shall be treated? For example, it is not legal to landfill wood in Denmark, and therefore a landfill scenario would not be relevant for a product sold only in Denmark. Similarly, there may be extended manufacturer responsibility dictating how the product is handled after its lifetime.

[29] The wish or intention to document positive/good initiatives, e.g. a take-back scheme with the manufacturer, is understandable. However, the existence of the scheme is not a guarantee that any of the used building material will actually be returned to the same manufacturer, and is therefore not accepted as sufficient substantiation of established infrastructure that is economically viable and commonly applied

- **Official waste statistics and reports** (e.g., on recycling potentials and realized recycling). For common materials in fractions large enough to be covered in waste statistics, national average figures may typically be found.
- **Demolition/waste handlers:** If average data on the specific product is not available or need more information, contact those who know most about how the specific fraction will be handled. For example, how much energy consumption the machines have, and which fractions are actually sent for recycling, and which are disposed of.
- **If the manufacturer has a take-back scheme:** The scheme shall be substantiated by explaining quantities. It shall be "significant quantities" – e.g. if sending out 100 kg and less than half a kilo comes back, the take-back scheme has not shown to be practically viable. There is not yet a standardized way to document that a take-back scheme is operational. Therefore, it's important to relate to the collection of EoL products of the specific manufacturer and how this may sufficiently be substantiated in the project report.

#### 6.11.2 100% OR AVERAGE SCENARIO?

Both 100% scenarios (e.g., 100% incineration, 100% recycling) and national or regional averages (e.g., 70% incineration, 30% recycling for DK) are allowed in EPDs published through EPD Danmark.

If 100% scenarios are declared, the dominant scenario shall be declared as a minimum. Alternative scenarios can then be declared.

If wanted, both a local average and 100% scenarios can be declared. In this case, the same rule applies: as a minimum, the most likely 100% scenario shall be declared. Averages shall be substantiated with a relevant source.

#### 6.11.3 NEW TREATMENT METHODS AND NEW PRODUCTS

For new schemes, it shall be proven that they have practical application, and that the infrastructure is established. Otherwise, it cannot be declared in the EPD as a result. It may be mentioned in 'additional information' that such an alternative scenario is underway or possible, but a GWP 'saving' or LCIA results for the scenario is not allowed.

For products and materials where there is no current practice, the most realistic process based on current/valid practice shall be assessed. Disposal scenarios for similar materials can be referenced.

### 6.12 MASS BALANCE

Completeness and plausibility of the data selected and used shall be checked. To do this, mass balance and/or energy balance and/or carbon balance are well suiting approaches, as they can be used to demonstrate that product-related inputs and outputs are balanced, and discrepancies are addressed in the documentation of the study (in the project report).

See more on mass balance in Informative Annex B, of EN15941.

## 7 LCI INDICATORS

### 7.1 ENERGY RESSOURCE INDICATORS ACROSS THE PRODUCT LIFECYCLE:

PERE, PERM, PERT, PENRE, PENRM and PENRT describe the consumption of renewable and non-renewable energy sources as energy and raw material, respectively.

These energy resources shall be tracked and declared both in and out of the considered product system. When not using the term 'output', this is because also the conversion of the raw material into energy with a negative value in PERM or PENRM is considered, even though it does not leave the system as raw material.

**Info box**

PERE: Use of renewable primary energy excluding renewable primary energy resources used as raw materials;
PERM: Use of renewable primary energy resources used as raw materials;
PERT: Total use of renewable primary energy resources; *(PERT = PERE + PERM)*
PENRE: Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials
PENRM: Use of non-renewable primary energy resources used as raw materials
PENRT: Total use of non-renewable primary energy resources *(PENRT = PENRE + PENRM)*

Products made from materials that can be used as energy resources, e.g. wood, plastic or paper, will appear in either PERM or PENRM with the value calorific value $\left(\frac{MJ}{kg}\right) * kg \ = MJ$. The lower calorific value shall be used. The calorific value is an inherent property and shall, on an equal base with e.g. biogenic carbon, not be allocated, but follow the physical flow. It shall therefore also be included, even if the input material comes without environmental impacts, as a secondary raw material/material. PERM or PENRM shall therefore be inserted in the relevant module regardless of whether the input material consists of primary material or secondary material.

All other inputs of primary energy resources should be considered as energy used as an energy carrier (PERE or PENRE). If a material is first used as a raw material, e.g. in packaging, and its energy content is later used as an energy carrier in the product system, e.g. in the production of energy through waste incineration, it should be classified as energy used as an energy carrier. This is to avoid double counting of this energy.

At the end of its useful life or disposal, the product will appear in the indicators in one or more ways:

- **Reuse and recycling**: If the product is reused or recycled, it should leave the system in C3 and appear in the table with a negative value in PERM or PENRM (MJ) and a positive value in either MFR (kg) or CRU (kg), depending on the scenario
- **Conversion to secondary fuel**: If the product is sent out of the system in C3 in the form of a secondary fuel, it should appear in the table with PERM or PENRM (MJ) as a negative value and a positive value in MER (kg).
- **Incineration in C3**: If the product is sent to waste incineration with an energy recovery efficiency of more than 60%, it should leave the system in C3 and appear with negative value in the table with PERM or PENRM (MJ), and positive value in PENRE or PERE (MJ) and EEE and EET (MJ)
- **Incineration in C4 (energy efficiency below 60%)**: The flow is not shown in the energy resource indicators in the C modules. This imbalance is due to the fact that the energy resource is considered “Consumed as raw material” and is not transformed into something else that is taken out of the system. Rarely used, as most modelled scenarios include higher energy efficiency combustion. The flow shall still be shown in EEE and EET (MJ).
- **Landfill**: The flow is not shown in the energy resource indicators in the C modules. This imbalance is due to the fact that the energy resource is considered “Consumed as raw material” and is not transformed into something else that is taken out of the system. The flow shall still be shown in EEE and EET (MJ).

Declaration for these categories will often require manual calculation to ensure that energy resources are included and divided correctly.

**Example**

Plywood sheets are supplied in plastic packaging.

The calorific values are assumed 40 MJ/kg plastic and 20 MJ/kg plywood for this illustrative example. The plywood weighs 5 kg per $m^2$, and 200 g of plastic is used. In addition, 150 MJ of wind turbine power is used in the production per $m^2$ plywood sheet.

When handling the waste of the plywood sheet, a 100% collection rate is assumed. When incinerating, an efficiency of 85% is assumed and the distribution between heat and electricity is assumed to be 50/50 in this example.

**Case 1: Recycling of plywood sheet. Packaging is incinerated.**

| RESOURCE USE per $m^2$ | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Parameter | Unit | A1-A3 | A4 | A5 | C1 | C2 | C3 | C4 |
| PERE | [MJ] | 150 | | | | | 0 | |
| PERM | [MJ] | 100 | | | | | -100 | |
| PERT | [MJ] | 250 | | | | | -100 | |
| PENRE | [MJ] | 0 | | 8 | | | 0 | |
| PENRM | [MJ] | 8 | | -8 | | | 0 | |
| PENRT | [MJ] | 8 | | 0 | | | 0 | |

| WASTE CATEGORIES AND OUTPUT FLOWS per $m^2$ | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Parameter | Unit | A1-A3 | A4 | A5 | C1 | C2 | C3 | C4 |
| CRU | [kg] | | | | | | | |
| MFR[30] | [kg] | | | | | | 5 | |
| MER | [kg] | | | | | | | |
| EEE | [MJ] | | | 3,4[31] | | | | |
| EET | [MJ] | | | 3,4 | | | | |

**Case 2: Plywood sheet is sold as wood chips for energy. Packaging is incinerated.**

| RESOURCE USE per $m^2$ | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Parameter | Unit | A1-A3 | A4 | A5 | C1 | C2 | C3 | C4 |
| PERE | [MJ] | 150 | | 0 | | | 0 | |
| PERM | [MJ] | 100 | | 0 | | | -100 | |
| PERT | [MJ] | 250 | | 0 | | | -100 | |
| PENRE | [MJ] | 0 | | 8 | | | 0 | |
| PENRM | [MJ] | 8 | | -8 | | | 0 | |
| PENRT | [MJ] | 8 | | 0 | | | 0 | |

| WASTE CATEGORIES AND OUTPUT FLOWS per $m^2$ | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Parameter | Unit | A1-A3 | A4 | A5 | C1 | C2 | C3 | C4 |
| CRU | [kg] | | | | | | | |
| MFR | [kg] | | | | | | | |
| MER | [kg] | | | | | | 5 | |
| EEE | [MJ] | | | 3,4 | | | | |
| EET | [MJ] | | | 3,4 | | | | |

[30] When directly recycling the plywood sheet, it will appear as CRU and not MFR in C3.

[31] Calculated as $0{,}2\ kg * 40 \frac{MJ}{kg} * 0{,}5 * 85\% = 3{,}4\ MJ$

## 7.2 OUTPUT FLOWS - WHEN TO USE CRU, MFR, MER AND EEE/EET

There are three important points when identifying what output flow, is dealt with:

a) The indicators describe flows that cross the system boundary – and D is outside the system boundary.
b) Waste shall always be modelled until it reaches the end-of-waste stage or is disposed of.
c) Flows leaving A1-A3 shall be allocated as co-products, as described in section 6.6.

A material meets the end-of-waste stage when all of the following criteria are met:

- There is a more or less specific use for the product, which is widely used.
- There is a market or a demand for the material, i.e. that money is paid for the material
- The material meets the technical requirements set and complies with relevant legislation, so that the material can be used for the specific purpose, e.g. as input in products
- The use of the material does not adversely affect the environment and human health.

The end-of-waste criteria are described in EN 15804 chapter 6.3.5.5 and Annex B[32].

The various output flows can in a way be regarded as a declaration of which level in the waste hierarchy a material flow, that has reached the end-of-waste stage, is at, when it leaves the system. Therefore, the same material cannot appear in two levels at the same time. E.g. a material cannot appear both as MER and EEE/EET, as it either leaves the system boundary unburned as secondary fuel or is incinerated first and then leaves the system in the form of energy.

### 7.2.1 COMPONENTS FOR REUSE (CRU):

If a product or material can be reused directly or can be prepared for reuse, it belongs in this category. E.g. bricks that leave C1 and are cleaned to be subsequently bricked into a new wall will belong here.

### 7.2.2 MATERIAL FOR RECYCLING (MFR):

If a material can be processed for recycling, it will belong here. There will often be further processing of the material in D before it has a quality (functional equivalence) corresponding to that for which credit is given. E.g. plastics and metals prepared for material recycling belong here.

### 7.2.3 MATERIAL FOR ENERGY RECOVERY (MER):

Material for energy recovery does not cover materials that are incinerated within the system boundary and does not cover incineration as waste treatment. For MER, it also applies that there shall be modelling for end-of-waste. To be able to leave the system as MER, the material shall be considered secondary fuel and the combustion process shall have an efficiency of more than 60%.

### 7.2.4 EXPORTED ELECTRICAL ENERGY AND EXPORTED THERMAL ENERGY (EEE AND EET):

Defined as the amount of energy produced in connection with waste incineration. The energy is divided into electrical and thermal energy, of which the distribution between the two is defined based on the efficiency of the incineration plant and will most often be a national average.

The flow shall be declared in the module where it occurs. This means that packaging waste incinerated in A5 shall be declared in EEE/EET under A5, while incineration[33] of a wooden floorboard after demolition of the building will give rise to a value in EEE/EET in C3. The energy may also result in a credit in the D module, where it replaces other energy production.

[32] The definition of EoW in relations to EN 15804 chapter 6.3.5.5 and Annex B, are not necessarily in line with the waste definitions of national or EU laws.
[33] in an incineration plant with energy utilization efficiency above 60%

Special rules apply to A1-A3, as chapter 6.3.5.2 of EN15804+A2 states that flows leaving the system at the end-of-waste boundary from these modules shall be allocated as co-products. Allocation procedures are described in section 6.6 of these Technical Rules and Guidelines, and section 6.4.3.2/6.4.3.3 of EN15804.

# 8 CONTENT OF EPDS

EPDs registered with and published through EPD Danmark shall, as a minimum, contain all elements specified in EN 15804+A2 ch.7 and EN 15942, along with the mandatory ECO Platform content:

- A statement of the applied background database and software, and both its versions
- A statement that the applied allocation method for post-consumer waste is cut-off
- A statement which version of characterisation factors was used, ensuring the latest version has been used.
- Energy mix/type used in modelling
- A description of representativity in average EPD (EN 15941, Ch. 3.1 and 3.2),
- A table for declaring biogenic carbon as per EN 15804+A2 and ECO Platform LCA Calculation Rules
- A place for additional impact or LCI indicators,
- A place for additional environmental information dependent on the applicable PCR
- (if relevant) a table describing carbonation assumptions (see 6.10.3)

A "List of content to declare" can be found in chapter 2.4 of the Verification Guidelines V8.0 of ECO Platform[34].

EPDs registered with and published through EPD Danmark are required to use the EPD templates provided by the secretariat. These can be obtained by contact to the secretariat. As the EPD templates are regularly updated, it is recommended to enquire the latest version upon commencing an LCA study for EPD development.

## 8.1 COMPOSITION DECLARATION

The EPD shall include a description of the material composition of the declared product. This is indicated in a table, expressed in weight percentage. As a general rule the composition shall be presented precisely, but with the possibility to group materials, such as 'additives' and 'biocides.' Grouping of materials in the composition declaration table, is only allowed for materials with similar function and characteristics. For values less than 5% the content can be declared as less than (‘<’) a relevant value/threshold.

In special cases where providing precise product formulations is detrimental to the competitive conditions of the company, there is, in addition to grouping the materials, the option to indicate a range of 10%. An example is presented in Figure 5. It shall be justified to the verifier, why this is necessary in the specific case.

In extra special cases, the product composition may be concealed in the EPD. However, it shall be available to the verifier and EPD Danmark. Whether a Non-Disclosure Agreement (NDA) is necessary to access the necessary information is a matter between the verifier and the EPD owner/manufacturer.

In addition to the declaration of product material composition, the total weight (mass) of packaging, and the composition shall be declared.

[34] https://www.eco-platform.org/our-documents.html

The material composition of the declared product:

| Materials | % |
|---|---|
| Water | 20-30 |
| Binder | 30-40 |
| Extender | 15-25 |
| Titanium dioxide | 15-20 |
| Pigment | < 0.1 |
| Solvent | < 0.1 |
| Additive | < 3.5 |
| Biocide | < 0.5 |

**Figure 5. In special cases where providing precise product formulations is detrimental to the company's competitive conditions, there is, in addition to grouping the materials, the option to indicate a range of the material composition.**

## 8.2 CONTENT OF SUBSTANCES OF VERY HIGH CONCERN (SVHC)

It is important that it is considered whether there are substances from the REACH candidate list in the product. As there are often high requirements for handling these substances, a manufacturer should know whether they handle such substances, and if not, they should easily find the information.

It shall be stated whether the product contains substances on the REACH Candidate List[35], and if so, the percentage (w/w) of the product, shall be stated. Only substances that end up in the product shall be declared, and because of that, substances contained in auxiliary materials do not have to be declared in the EPD. For mixing of chemicals and the like, special attention shall be paid to the substances that may occur as a result of chemical reactions.

A statement shall be obtained from the EPD owner supporting the content/non-content claim. In some cases it may be relevant to obtain the signature from the supplier, to supplement the EPD owners. The declaration shall be made on the letterhead of the EPD owner and signed by them. It is the responsibility of the EPD owner to declare correctly.

Only one of the two text sections in the EPD template acquired from the secretariat of EPD Danmark shall be used, and the other deleted.

## 8.3 ENERGY MODELLING TRANSPARANCY

The EPD shall describe the energy modelling principles, with regards to use of Guarantees of Origin, energy mixes used in the foreground system and energy mix used in the background system.

The emission factors shall be declared as described in 6.5.2

## 8.4 MASS FACTOR AND MATERIAL PROPERTIES

Mass factors and material properties are important because they make the conversion of the results from one unit to another possible.

In the case of EPDs where the declared unit means that many products are indicated, such as by specifying 'kg of steel mountings,' there shall be a table showing the weight of all products covered by the EPD. When digitizing to the ILCD+EPD format, the impact for all specified products is calculated, and therefore it should be considered whether the number of datasets is appropriate or whether average calculations or worst-case data are a better option. This point can be omitted if the product is a custom order (all products are unique) or if very large quantities of products are indicated (> 40 item numbers).

[35] https://echa.europa.eu/en/candidate-list-table

### 8.4.1 MASS FACTOR (MASS VALUE)

The mass factor is the indication of the weight of '1 unit,' e.g., kg/m² or kg/piece. That is, 'kg per declared or functional unit.' The mass factor is a mandatory value but can be omitted in special cases where it is not possible to determine a mass for the reference unit, such as in calculations for services.

### 8.4.2 MATERIAL PROPERTIES

Which material properties make sense to specify largely depends on the declared unit. Table 2 provides an overview of which material properties are required, depending on the selected declared unit. The material properties shall be stated under "LCA Background" in the EPD and appear in the project report.

**Table 2. Overview of which material properties are required, depending on the selected declared unit**

| DECLARED UNIT | MANDATORY PROPERTY |
|---|---|
| AREA ($M^2$) | grammage ($kg/m^2$)<br>layer thickness (m or mm) |
| VOLUME ($M^3$) | (gross) Density ($kg/m^3$) |
| LENGTH (M) | Linear density (kg/m) |
| ITEM (PCS) | Weight per piece (kg/pcs) |
| OTHER | Density, if possible |

## 8.5 ADDITIONAL INFORMATION

EPDs may include additional environmental information beyond LCA data, provided it is specific, accurate, relevant, verifiable and not misleading. Such information shall be substantiated in the project report and verified during EPD verification, with preference given to quantitative over qualitative data. Any quantitative emission information shall be supported by third-party laboratory testing results or references to underlying studies.

Additional information in EPDs can be presented either in the main document (as separate chapters or tables) or in annexes/EPD appendix but shall not be combined with mandatory EN 15804+A2 results tables. Any annex or EPD appendix is considered an integral part of the EPD and requires full verification alongside the main document.

Additional information in EPDs may include:

- Site and address listings
- Extensions from mutual recognition programmes
- Scaling tables or results with variants (e.g., different toppings for insulation slabs)
- Environmental and safety information:
  - Indoor air, soil, and water emissions during use
  - Product usage instructions for optimal environmental performance
  - Maintenance and service guidelines
  - Durability information
  - Recycling procedures and benefits
  - Reuse methods and EoL disposal instructions
- Organizational environmental information:
  - Environmental management systems
  - Detailed environmental initiatives
  - Contact information for further environmental details

EPD published through EPD Danmark shall strictly adhere to EN 15804, along with the GPI and Technical Rules and Guidelines of EPD Danmark. Results based on mass balance approaches, offsets, insets, or multi-recycling effects in module D are prohibited from inclusion in any EPDs and is not allowed in 'additional information' or EPD appendixes either.

Any additional information, including LCA-derived environmental data, shall be clearly identified as supplementary content, particularly when presented in annexes or an EPD appendix.

Additional information presented in annexes or an EPD appendix is only allowed if EPD Danmark has provided templates for such specific annexes/EPD appendix.

#### 8.5.1 EPD APPENDIX CONTAINING RESULTS FOLLOWING EN15804+A1

EPD Danmark no longer publishes EPD appendices according to EN 15804+A1.

# 9 DIGITAL EPDS

All EPDs published through EPD Danmark shall be digitized. The aim is for the EPDs to be directly imported into the relevant software for LCA of buildings and construction.

## 9.1 DIGITIZATION OF EPDS

Digitization of EPDs registered with and published through EPD Danmark, shall be performed using the technology provided by EPD Danmark, to ensure that all digital data is created correctly and validated before being made available. This can be done by awaiting the free digitalization to be performed by the staff of EPD Danmark, or by supplying the secretariat with a completed version of the import sheet, provided in EPD Danmark's 'Konsulentkit v. 2024.2', following the procedure also found in the kit.

By fall 2025, a new procedure for creation of digital EPDs will be presented.

## 9.2 AVAILABILITY OF DIGITAL EPDS

Digital EPDs are available through the database on the EPD Danmark website in the 'lb5EPD'-format, developed for LCA Byg, and via ECO Portal[36] in the ILCD+EPD format. The EPDs are available via API from ECO Portal.

## 9.3 AVERAGES, RANGES AND MATERIAL PROPERTIES IN DIGITAL EPDS

With increased digitalization, there is a greater need to specify precise values rather than ranges and variances. For material properties, which are often used for converting results into other units, it is particularly important that no information is lost when the EPD is digitized.

In average EPDs, the average value shall be specified. In the case of materials with varying properties, such as wood, where moisture content causes fluctuations in density, an average shall also be specified. A variance may be indicated as +/- x% after the declared value, but this will not appear in the digital version. The variation shall be stated in the project report, even when not included in the EPD.

In the case of EPDs where the declared unit means that many products are indicated, such as by specifying 'kg of steel mountings,' there shall be a table showing the weight of all products covered by the EPD. When digitizing to the ILCD+EPD format, the impact for all specified products is calculated, and therefore it should be considered whether the number of datasets is appropriate or whether average

[36] https://www.eco-platform.org/epd-data.html, via the ECOSMDP node, provided by ECO Platform

calculations or worst-case data are a better option. This point can be omitted if the product is a custom order (all products are unique) or if very large quantities of products are indicated (> 40 item numbers).

## 10 EPD TOOLS AND LCA TOOLS

The high demand for EPDs makes tool solutions more and more relevant. While tool solutions may be used to optimize processes regarding the calculations and development of EPDs, all the requirements on LCA calculations and the EPD remains the same.

Specifications on developing and using a tool solution is describe in Appendix D of the General Programme Instructions of EPD Danmark.

## 11 DEFINITIONS, TERMS AND ABBREVIATIONS

The following definitions, terms and abbreviations apply in these General Programme Instructions and in the Technical Rules and Guidelines, project reports, EPDs and other communication under EPD Danmark:

| ABBREVIATION | DEFINITION |
|---|---|
| **ALLOCATION** | Partitioning of flows (input and output) to and from a process or product system between the product system under study and one or more other product systems. |
| **AVERAGE DATA** | Data representative of a product, product group or construction service, provided by one or more suppliers. |
| **ATTRIBUTIONAL** | Refers to process-based modelling intended to provide a static representation of average conditions, excluding market-mediated effects. |
| **BOOK AND CLAIM** | A book-and-claim system for electricity is a market-based mechanism where renewable energy certificates are purchased and claimed by buyers. By claiming electricity from a specific source, the buyer can use this specific production process in the model, usually giving lower impact in the LCIA. The book and claim system is established, because the electricity infrastructure is established in a way, where electricity origin cannot be identified at the point of use, but there is a need to be able to invest in renewable energy. |
| **CHARACTERISATION FACTOR** | Factor, calculated by means of a characterisation model (e.g. ILCD or Environmental Footprint (EF)), which may be used to convert the classified analysis results into the common unit (e.g. kg CFC-11 equivalents) of the category indicator (e.g. ability to deplete stratospheric ozone). |
| **CPCR** | Complementary Product Category Rules. Product group specific or horizontal PCR, which provide additional compliant and non-contradictory requirements to EN 15804. See section 5.2 for the use of cPCRs within EPD Danmark. |
| **CONSTRUCTION PRODUCT** | Item manufactured or processed for incorporation in constructions works. |
| **CONSTRUCTION SERVICE** | Activity that supports the construction process or subsequent maintenance. |

| | |
|---|---|
| **DECLARED UNIT** | Quantity of a product system for use as a reference unit for an LCA/EPD. Typically used for LCA covering the life cycle phases in cradle-to-gate. |
| **DIGITAL EPD** | A version of an EPD, in the ILCD+EPD format. In the digital EPD, the content of a published PDF EPD is fit to digital format, to make it useable in calculations. |
| **ELEMENTARY FLOW** | Energy or material that comes directly from nature (ecosphere) to the system under study (technosphere) or that goes directly from the system to nature. |
| **EN 15804** | European standard published by CEN, on a mandate from the European Commission. The standard forms the technical basis of the preparation of Type III Environmental Product Declarations for construction products (EPD). |
| **END -OF -WASTE** | 'End of waste' refers to the stage where a material ceases to be classified as waste and becomes a product or resource, ready for reuse, recycling, or further processing in accordance with regulatory criteria. |
| **ENVIRONMENTAL IMPACT CATEGORY/ENVIRONMENTAL INDICATOR** | Category representing environmental issues of concern in which analysis results may be classified – e.g." stratospheric ozone layer depletion". |
| **ENVIRONMENTAL PERFORMANCE** | Performance related to environmental impacts and environmental aspects. |
| **EPD** | Abbreviation for a Type III Environmental Product Declaration.<br>A Type III Environmental Product Declaration for a construction product in the context of EPD Danmark, is prepared on the basis of the European standard EN 15804 and ISO 14025.<br>As a document, it acts as a summary of the project report. |
| **EPD APPENDIX** | Additional document, published alongside the EPD in the EPD Danmark database. |
| **EPD OWNER** | An EPD owner is the company that is registered with EPD Danmark and has the legal responsibility for the EPD and content hereof towards EPD Danmark.<br>An EPD owner may be a manufacturer (for EPDs of goods), a service provider (for EPDs of services), a trader (e.g. a retailer or a wholesaler), or a trade/industry association. |
| **EPD TEMPLATE** | Template provided by EPD Danmark. All EPDs published by EPD Danmark shall be created according to the template. |
| **FUNCTIONAL EQUIVALENCE** | Quantified functional requirements and technical requirements for a building or an assembled system (part of works) for use as a basis for comparison. |
| **FUNCTIONAL UNIT** | The quantified performance of a product system for use as a reference unit, typically for LCA covering life cycle phases describing the use of the product. |

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| **GO** | A Guarantee of Origin (GO) is an official certificate that verifies and provides information about the source of energy, e.g. specifically confirming that a certain amount of electricity was produced from renewable sources and has been subtracted from relevant calculations/declarations of the electricity mix. |
| **ILCD+EPD** | An XML based format, in which the EPDs are presented in a machine-readable manner. Developed by the InData network. |
| **LCA** | Life Cycle Assessment.<br><br>The Life Cycle Assessment is the backbone of an EPD and is performed on the basis of the international standards ISO 14040 and ISO 14044. A Life Cycle Assessment compiles and evaluates all inputs and outputs and potential environmental impacts of a product throughout its life cycle. |
| **LCA CONSULTANT** | An LCA consultant may be internal or external to the EPD owner. The LCA consultant shall have the sufficient competencies to perform LCAs and develop EPDs. |
| **LCA EXPERT** | In this context an LCA expert is defined as a person who is either carries an education in product level LCA or has gained similar level of skill through practical LCA work |
| **LCI** | Life Cycle Inventory (analysis). Phase of the life cycle assessment involving the compilation and quantification of inputs and outputs of elementary flows. |
| **LCIA** | Life Cycle Impact Assessment. Phase of the life cycle assessment, aimed at understanding and evaluating the magnitude and significance of the potential environmental impacts of a product system. |
| **LIFE CYCLE** | Consecutive and interlinked stages of a product system, from raw material acquisition or generation from natural resources to final disposal. |
| **LIFE CYCLE STAGE** | Life cycle stages refer to the distinct phases of a product's life cycle. In EPDs this is defined by production (modules A1-A3), construction (module A4-A5), use (modules B1-B7), and end-of-life (modules C1-C4). |
| **MANUFACTURER** | 'Manufacturer' means any natural or legal person who manufactures a construction product or who has such a product designed or manufactured, and markets that product under their name or trademark; [37]<br><br>Cases in which obligations of manufacturers apply to importers and distributors: An importer or distributor, registered as an EPD owner, shall be subject to the obligations of a manufacturer, where they register a product under their name or trademark or modifies a construction product already placed on the market in such a way that conformity with the content of the EPD may be affected |

[37] Article 2 from REGULATION (EU) No 305/2011:

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| **MARKET BASED APPROACH** | The market-based approach for energy, considers accounting for emissions or renewable energy usage where organizations report based on their purchased energy attributes, such as Guarantees of Origin (GOs), rather than the physical electricity consumed from the grid. |
| **MASS BALANCE APPROACH** | A technique by which flows with specified characteristics (which could be inputs or outputs, for example biobased material or recycled content) for a manufacturing process are allocated to individual products produced from that manufacturing process, not on the basis of the tracked physical flow, or on the basis of the average tracked flow over a specified time period, but on a theoretical basis.<br><br>The use of mass balance approach is not allowed within EPD Danmark, cf. section 6.4. |
| **(SIMPLE) MASS BALANCE** | Mass balance is used to check that the input and output values for the LCA model are balanced.<br><br>Mass balance (and/or energy balance or carbon balance) are well suiting approaches, to check completeness and plausibility of the data selected and used.<br><br>See more on mass balance in Informative Annex B, of EN 15941. |
| **PCR** | Product Category Rules. A set of specific rules, requirements and instructions for the development of an EPD for a specific product category. |
| **PPA, POWER PURCHASE AGREEMENTS** | A long-term contract between a buyer and an electricity producer, typically for renewable energy, where the buyer agrees to purchase electricity at a predetermined price to support clean energy generation. |
| **PRODUCT CATEGORY** | Group of products which can fulfil equivalent functions. |
| **PROGRAMME OPERATOR** | Organisation which develops and conducts a Type III Environmental Product Declaration Programme. |
| **PROJECT REPORT** | Often called LCA- or background report. The project report (PR) is the report describing the LCA, that is the basis of the EPD, in detail.<br><br>For EPDs developed by LCA tools, the 'LT project report' corresponds to the project report. For EPD tools, the 'ET project report' corresponds to the project report. For tools, a lot of details usually found in the 'Project report' can be found in the tool report. |
| **PROJECT REPORT TEMPLATE** | Template provided by EPD Danmark. The template gives a good indication of mandatory elements of the project report but is not mandatory itself and not exhaustive with mandatory elements for all product categories. |
| **RSL** | Reference Service Life – the expected service life of a product under a set of given conditions for the use of the product. |

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| **SCENARIO** | Collection of assumptions and information concerning an expected sequence of possible future events. |
| **TOOL REPORT** | The Tool Report is the report describing the technical details of a tool. A tool report shall also contain the descriptions of LCA modelling details, free parameters and sensitivity analysis for the tool. The tool report may also contain the documentation for verification of the test EPDs from the tool. |
| **TYPE III ENVIRONMENTAL PRODUCT DECLARATION** | In everyday language ”EPD” or ”environmental product declaration”.<br><br>A Type III Environmental Product Declaration provides quantified environmental information on a product's life cycle to enable comparisons between products fulfilling the same function. Such declarations are based on independently verified LCA data and are developed by means of predetermined parameters. The predetermined parameters are defined in the product's PCR and are based on the ISO 14040 series of standards (ISO 14040 and ISO 14044). |
| **VERIFICATION** | Confirmation that specified requirements have been fulfilled. The verification of the LCA data as well as the EPD itself shall ensure the reliability of the work performed. The verification shall be performed by an independent party to the EPD owner and LCA developer. |
| **VERIFICATION CHECKLIST** | The verification checklist is the template by which the verification shall be performed. The checklist creates a uniform and transparent process and is sent to EPD Danmark as part of the proof of verification. The filled checklist is not publicly available but is available to EPD Denmark in case of doubt on the EPD compliance or quality of the verification.<br><br>The checklists consist of issues that the verifier shall assess in the relevant project report. |
| **VERIFICATION REPORT** | The proof of verification. Consists of a declaration from the verifier, confirming the verification against the relevant verification checklist(s).<br><br>The verification report is available to anybody upon request and therefore shall not contain confidential information. |
| **VERIFIER** | Person (or body) that carries out verification. |

# 12 NORMATIVE BASIS AND GUIDANCE DOCUMENTS

Environmental Product Declarations, developed within the framework of the EPD Danmark programme, shall be in accordance with the following standards. For dated references, only the cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

**EN 15804** – Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products

**ISO 14025** – Environmental labels and declarations - Type III environmental declarations - Principles and procedures

**EN 15941** – Sustainability of construction works - Environmental product declarations – Methodology for selection and use of generic data

**EN 15942** – Sustainability of construction works - Environmental product declarations – Communication format business-to-business

**EN 17672** - Sustainability of construction works – Environmental product declarations – Horizontal rules for business-to-consumer communication

**ISO 14040** – Environmental Management - Life Cycle Assessment - Principles and Framework

**ISO 14044** – Environmental Management - Life Cycle Assessment - Requirements and Guidelines

**ISO 14020** – Environmental Labels and Declarations - General Principles

**ECO Platform standards**

Environmental product declarations and documents developed within the framework of the EPD Danmark programme should also follow the technical guidance, if relevant:

**CEN/TR 16970** – Sustainability of construction works – Guidance for the implementation of EN 15804

**ISO/TS 14027** – Environmental labels and declarations — Development of product category rules

And other relevant standards and methodology guidelines, including but not limited to:

**ISO 14067** – Greenhouse gases – Carbon footprint of products – requirements and guidelines for quantification

**ISO 14046** – Environmental management — Water footprint — Principles, requirements and guidelines

**ISO 22057** – Sustainability in buildings and civil engineering works — Data templates for the use of environmental product declarations (EPDs) for construction products in building information modelling (BIM)

**ISO 22095** – Chain of custody — General terminology and models

European Commission – Joint Research Centre – Institute for Environmental and Sustainability: **International Reference Life Cycle Data System (ILCD) Handbook** – Nomenclature and other conventions. 2010. EUR 24384 EN. Luxembourg. Publications Office of the European Union: 2010, ISBN 978-92-79-15861-2

Suggestions for updating the **Product Environmental Footprint (PEF) method**, EUR 29682 EN, Publications Office of the European Union

**EN 16757** – Sustainability of construction works – Environmental product declarations – Product Category Rules for concrete and concrete elements

**CEN/TR 17310** – Carbonation and CO2 uptake in concrete