

ECO PLATFORM

LCA Calculation Rules and Specifications for EPDs

Version 01 (December 2023)



Table 1: Version of this document

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V 01	20.12.2023	Excluding LCA rules into separate document

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1 INTRODUCTION

The EPD Verification Guidelines developed by ECO Platform have been revised to allow an up to date and harmonized handling of key processes associated with the development, publication, and management of EPDs. Also, it has been necessary to provide a more practical structure of the guidelines. For this purpose, the ECO Platform Technical Working Group (TEWOG) agreed to split the former “ECO Platform Audit and Verification Guidelines V6” into three documents:

- Verification Guidelines for ECO EPD Programme Operators
- LCA Calculation Rules and Specifications for EPD
- Audit Guidelines for ECO EPD Programme Operators

2 ECO EPD

2.1 General Information

The European standard EN 15804 is the basis for the common EPD approach by all ECO Platform members. Outside of Europe ISO 21930 which is based on EN 15804 can also be taken as a basis for ECO EPD.

The ECO Platform members also have committed to mutually recognize the EPD when they are verified according to the common ECO procedures laid out in this document, as providing a common level of quality based on ISO 14025 and EN 15804.

2.2 Structure of Documentation

This document is part of the ECO Platform Standards.

It has been developed to be applied to construction products and electric/electronic products that are considered as construction products but is not limited to construction products only (see EN 50693 for more information).

2.3 Goal

The objective of this document is to provide technical information for LCA (Life Cycle Assessment) developing. It is the result of the ECO Platform approach to homogenize the development of verified environmental information of (construction-) products, in particular Type III declarations called EPD (Environmental Product Declarations) and to provide a harmonized verification procedure among the ECO Platform members.

3 GENERAL REQUIREMENTS FOR EPD CALCULATION (AND WITH THAT: VERIFICATION)

3.1 Principles

Verification of ECO EPD shall ensure that the EPD is in compliance with referenced ECO Platform standards and declares all required content mentioned in a valid version of the “LCA Calculation Rules and Specifications for EPDs” (see “ECO Platform Standards – General Remarks” for a list of all standards).

3.2 General Requirements

ECO EPD

An ECO EPD with the “ECO EPD verified” logo can be a cradle-to-gate, cradle-to-gate with options, or a cradle-to-grave EPD.

Note for pooled material resources: Mass balance approaches (MBA) and/or “Book and Claim” methods as per ISO 22095 (e.g. BMB (biomass balance) and/or recycled content allocation (attribution) approaches) shall not be used in connection with ECO EPDs. Note for pooled energy resources chapter 3.3.4 applies.

For ECO EPD the LCA-Method cut-off by classification is the only accepted method for LCA calculation.

3.3 Calculation rules for the Life Cycle Assessment and Requirements on the Project Report

3.3.1 Functional Unit

The functional unit of a construction product shall specify:

- the application of a product or product groups covered by the functional unit;
- the reference quantity for the functional unit when integrated in the construction works;
- the quantified key properties, when integrated into a building, for the functional use, quantified performance characteristics or minimum performance of the construction product, taking into account the functional equivalent of the building;
- the minimum performance characteristics under defined conditions shall be fulfilled over the defined time period of the functional unit;
- a specified period of time under reference in-use conditions considering the RSL. If the functional unit uses a different time period than the RSL, the RSL shall be given as technical information in the EPD.

3.3.2 Composition of the Product

The level of detail that is required is the following:

- the main components necessary to understand what type of product is concerned (detailed mass description is not necessary if confidential).
- In case of average EPD: at minimum qualitative description of averages and qualitative description of ranges.

3.3.3 System Boundary

For products in the Scope of EN15804 comprehensive declaration of modules A1-A3, C and D as a minimum requirement, with exceptions mentioned in EN15804+A2 chapter 5.2.

- Only products which fulfil all three of the conditions below shall be permitted to be exempt from this requirement:
 - the product or material is physically integrated with other products during installation so they cannot be physically separated from them at end of life, and
 - the product or material is no longer identifiable at end of life as a result of a physical or chemical transformation process, and
 - the product or material does not contain biogenic carbon.

The following are the minimum requirements if there is no CEN TC c-PCR:

A1-A3 modules

- As for energy, the marked based approach as per ISO 14067 and prEN 15941 can be calculated, but no other methods of offsetting or insetting are allowed.
- Application of the “polluter pays” principle to the use of waste as substitute for primary fuels or materials is left to the programme operator.
- Presentation of the energy and material flows as a result of deviating allocation processes.
- No declaration of loads and benefits in Module D from allocation of co-products in A1-A3.

B modules

- B6 (energy consumption) shall be added in the calculation of EPD of final products which are consuming energy, directly or indirectly (ex. a cable is consuming energy through dissipation/losses in the cable when electricity goes through it. B6 shall be presented separately to let users of the EPD accommodate the calculation when appropriate).
- If there is no c-PCR available the program operator may provide a justified use scenario to apply for each family of products (or Product Category) that it covers within its program, 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 (see also “regulatory context”).

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 CO₂ from the technosphere to nature.

3.3.4 Pooled Energy Resources with Contractual Instruments

Contractual instruments can include energy attribute certificates, renewable energy certificates (RECs), guarantee of origin (GOs) or green energy certificates.

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.

3.3.4.1 Electricity Rules

Rules for ECO Platform POs on the use of Guarantees of Origin (GO, defined as per ISO 14067 and prEN 15941):

- If a PO decides that the program shall accept GOs, all EPD in the programme shall follow the rules of this document for the quantification of the LCA with respect to electricity generation: Double counting must be avoided. This means that all electricity generation in all EPD without GO shall be calculated with residual mix. (In case data bases do not yet provide aggregated upstream data sets with residual mix, this shall be noted in the project report under data quality description).
The use of consumption mixes for all electricity generation (and no GOs) may be communicated either as additional information in the same EPD, or as textual information, or added as an additional result table, or as an additional scenario, or as two EPDs.
- If a PO decides that GO cannot be used for the quantification of the LCA with respect to electricity generation, all EPD shall be calculated applying the national consumption mix. The use of residual mix or GOs for all electricity generation can be communicated as additional information in the same EPD either as textual information or added as an additional result table.
- GO validity shall be followed up. POs shall have a procedure of assuring proof of assigned GOs on a regular basis.

Case 1: manufacturer produces energy on site

If producers sell energy (with or without GOs) from their own renewable plants on site, they must not use the same energy (with or without GOs) themselves! They must buy GOs from other energy suppliers or declare residual mix figures.

Case 2: Electricity provider chosen from national state with legislation for electricity labelling

Task: Energy providers must deliver proof of origin (Mandatory: Contract papers with name and address of contract partners, Optional for the time being: addresses of plants, sites). Energy amounts from contracts/accounting documents must correspond to energy consumption in LCA.

Note: tracking numbers could sometimes only be provided from national energy control bodies. These systems are fully digitalized and the “book and claim” method is fully automatized. Energy providers book and within seconds the energy amounts are cancelled in the AIB system. That is done MWh per MWh and proof documentation in form of Excel sheets etc. would be thousands of lines. This kind of proof shall only be demanded and checked by verifiers in case of justified doubt about all other documents delivered by energy providers/certification bodies.

Case 3: Electricity provider chosen from national state with registry

As Case 2, GOs must be provided with tracking numbers, check on double counting: used tracking numbers must be cancelled in registry. (Note: Tracking numbers are in most cases (but not all!) deleted automatically in national systems, sometimes energy providers are able to deliver excel files to check on energy amounts versus number of certificates. Solution: Show proof for tracking or documentation of justification why tracking was not possible.

Documentation shall be checked on the following information, GO documents must be provided:

Mandatory:

- Energy provider
- Manufacturer
- Electricity mix, attributes of electricity
- Energy amounts
- Time periods for issue and validity of GOs

Optional, justification must be provided if information is not available:

- Addresses of power plants
- Tracking numbers
- Information on (direct) coupling yes/no

Note: 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.

Note: Proof from external verification bodies (accredited bodies) may contain less information than listed above so further checks may be necessary.

Note: sometimes only 100% green energy products are deleted from registry. Mixes of green energy and non-renewable energy are sometimes not deleted. (Example: Energy providers may only state that they have certain amounts of renewables in the mix, but no GOs available):

Conclusion:

A sensitivity analysis shall be carried out, in case that significant amounts of electricity cannot be tracked: No tracking numbers and transparent GOs: No acceptance -> residual Mix.

Solution for ECO Platform: “significant” means “if the change in amounts of electricity lead to more than 10% change in results of GWP total”, see EN 15804.

Note for upstream data:

products with a high percentage of electricity in upstream data should be looked at with attention/check if specific data for upstream processes is available.

Justification required, if not available.

Intermediate conclusion if GOs are available but without confirmation of cancelling:

proof that manufacturers have asked for cancellation confirmation is sufficient for a period of up to a max. of the validity of the EPD.

Case 4a: Energy provider from national state (or federal state) with no registry (inside EU and EEA):

No benefit of contractual instruments, use consumption mix (residual mix would be consumption mix and with that worst case).

Case 4b: Energy provider from national states (or federal states) with no registry (outside EU and EEA):

Same requirements as Case 3, except for the requirement to provide tracking numbers to a registry. To avoid double counting, the residual mix is conservatively estimated by subtracting renewables from the consumption mix.

Note - Definition for the term “registry”:

Contractual instruments such as Guarantees of Origin (in the USA called RECs) can only be working with a reliable and transparent book and claim registry to avoid double counting. The ECO Platform definition of “reliable and transparent book and claim registry” is as follows:

The registry must be run by an independent organization and must cover ONE geographical region and be the only one there. Within this clearly defined geographical (not necessarily national) region energy producers shall only be allowed to declare their produced kWhours in the mentioned registry, not in many different registries on the globe that may not be connected to compare who is declaring what where. Double counting shall be avoided by that rule.

For all 4 Cases:

If Contractual instruments are accepted and applied:

- specific data for energy generation shall be used whenever available
 - i.e. have the foreground processes (e.g. in module A3) been calculated with the specific data from the supplier of the electricity?
 - has the residual mix been used for the quantification of all electricity generation without contractual instruments for foreground data?
- background data:
 - has been calculated using the residual mix for the relevant electricity generation without contractual instruments?
 - a justification has been provided if relevant electricity generation without contractual instruments has not been calculated with residual mix?
- Has the consumption mix (= national production + imports – exports), been applied for any modules beyond the modules A1-A3 (i.e. the factory gate), for which no contractual instruments are used?

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 direct control over a particular process in any of the B modules and/or C modules (which, e.g., may be the case for construction services or for recycling), generation of electricity used in this process may be modelled with contractual instruments and residual mix.

Reporting Communication

Reporting an additional quantification in the project report is recommended:

- market based approach: using GOs and residual mix,
- location based approach: using the actual consumption mix (= national production + imports – exports),
- If a double quantification is reported in the project report, options are:
 - to provide 2 EPD
 - to declare two result tables in the EPD
 - to declare two scenarios in the EPD
 - to provide an interpretation of the different results in the EPD

If the contractual situation is not clear (see last position in ISO 14067) a sensitivity analysis shall be reported in the project report.

Note:

In some countries, parts of the electricity from renewable energy sources might be sold/exported as renewable electricity without being excluded from the supplied mix. For this reason, in such cases a sensitivity analysis applying the relevant consumption grid mix shall be conducted and reported in the project report to demonstrate the difference in results of the electricity tracking instruments.

Calculation of residual mixes

Available datasets from background databases can be taken. If no datasets are available or applicable the calculation of the residual mix shall be done as follows.

For countries that are members in the AIB-system, the AIB methods shall be used for calculating the residual mix.

The method implemented within the LCA (year and name of document) shall be referenced (in EPD as well as in project report).

Modelling of European residual mixes must follow the latest AIB Guide with the newest method.

<https://www.aib-net.org/facts/european-residual-mix>

For countries which aren't members of the AIB-system self-modelling shall be carried out.

Transparent and trackable documentation is mandatory in the project report for the electricity purchased in the A3 processes.

Note:

This document does not formulate explicit rules on which electricity mixes to use for upstream data of supplied materials.

LCA-practitioners shall provide emission factors to the verifier per kWh modelled electricity mixes used in the manufacturing processes in A3, at least for the GWP-indicators, or for core EN 15804+A2-LCIA-indicators (in the project report or by alternative means).

3.3.4.2 Biogas Rules

If GOs for biogas are accepted by the POs

Biogas from the gas network

Biogas certificates/GO shall be used when the supplier is able to guarantee that the biogas meets the requirements for tracking and traceability, see prEN 15941 E.2.1. For gas purchased without the certificates the residual mix shall be applied.

Biogas from a directly connected supplier

Life cycle data for the biogas supplied may be used if there is a dedicated pipeline or supply between the organization and the biogas plant from which the life cycle data is derived, and no contractual instruments have been sold to a third party for that consumed biogas. Otherwise, the residual mix shall be used.

Internally generated biogas

For internally generated and consumed biogas, where no contractual instruments have been sold to a third party, the life cycle data for the biogas shall be used for that product. Otherwise, the residual mix shall be used.

Residual gas mix

As long as the AIB system does not provide Guidance and/or data sets for residual gas mixes and the background databases also do not give appropriate data sets, the residual mix must be calculated following the AIB guidance for green electricity as closely as possible.

Note 1:

For tracking and traceability, the rules of green electricity apply accordingly.

Note 2:

For biogas it is not always clear at which geographical point in the gas grid the biogas is put into the pipe system nor are the pipe systems connected in a way as electricity grids are connected. Until further notice a physical connection of gas grid systems is not required to accept GOs for biogas.

Note 3:

The above rules are meant only for input as energy carrier (not as feedstock).

3.3.4.3 Additional information for transparency for energy

Mandatory:

- Provide in the EPD the GWP of the specifically applied electricity mix for A1-A3 in kg CO₂e/kWh;
- Provide the GWP of the applied specifically gas mix for A1-A3 in kg CO₂e/MJ.
- Justification shall be given in the Project Report if any information is not provided”;

- Minimum: use of Residual Mix or of modelled energy mix shall be declared. Information if GOs are used must be declared in the EPD.

Optional:

- Detailed description of Energy datasets used should be provided in the EPD.

3.3.5 Specific Allocation Rules

In order to avoid inconsistencies through diverging interpretation of the provisions for the definition of allocation rules, specific rules for the allocation in certain situations have been defined. For the sake of consistency, these rules shall apply to all ECO EPDs that are affected by these allocation rules.

3.3.5.1 Allocation procedures for processes producing co-products used in cement and concrete

Until a consistent approach is in place in standardization, all ECO Platform POs are required to use economic allocation for the processes producing co-products for use in cement and concrete, for example:

- steel production and granulated blast-furnace slag or crystallised basic oxygen furnace slag;
- coal fired electricity generation, fly ash and artificial gypsum, and other processes producing artificial gypsum;
- silicon metal and ferro-silicon alloys and silica fume and
- aluminium-oxide-containing sources arising from aluminium and alumina production.

For these co-products, economic allocation shall be used even if their contribution to the overall revenue of the process is very low (below 1%), to understand the impact, even if small, connected to these co-products.

Economic allocation should use market prices, averaged over a period in time as defined in ISO 14044 Amd2:2020 (chapter D4.3).

When assessing the impact of the high value co-products such as steel, electricity, silicon etc, economic allocation to these low value co-products used in cement and concrete can be omitted as a conservative choice. Other forms of allocation, for example, physical partitioning, system expansion or physical allocation, shall not be used to assign impacts to these low value co-products used in cement and concrete when assessing these high value co-products for use in ECO Platform EPD.

Where these co-products used in cement and concrete are used in other construction products, within ECO Platform EPD, the same rules of allocation shall apply.

4 LIST OF ADDITIONAL LCA CALCULATION RULES AND OTHER AGREEMENTS

4.1 General Information

This part gives an overview on further agreements of the ECO Platform (Decisions by the ECO Platform Board and/or General Assembly).

It addresses issues that are not dealt with in any EPD related legislation, standards, or any other guidance documents. It also defines exceptions in some cases, this means a definition of rules that are not mandatory to be followed, although regulated in standards or other guidance documents.

This section also refers to common approaches intended to increase the mobility of EPDs in Europe and across the world.

- **C-PCRs developed by CEN Technical Committees and approved by CEN/TC 350/WG 3 overrule Programme Operator related PCR documents.**

PCR according to EN 15804 published as EN standards by CEN for a product family shall have prevalence over any other PCR, unless technically justified.

The content of a national and/or Programme Operator related PCR should refer to the corresponding CEN c-PCR.

- **In an ECO EPD the ECO Platform EPD List of content shall be contained**

The EPD includes all the content of the “List of content to declare in an ECO EPD” in chapter 2.4 of the Verification Guidelines for ECO EPD Programme Operators.

- **CEN TR 16970 Sustainability of construction works** - Guidance for the implementation of EN 15804 for c-PCR

ECO Platform members shall consider the recommendations included in CEN/TR 16970 as best practices with the following three exceptions¹:

- No requirement where in the EPD document the indicators of an EPD are placed.
- It is optional to follow the guidance of Table 2 in CEN 16970 (polluter pays principle).
- The ECO Platform does not automatically accept default values in c-PCR at ECO Platform level, default values are subject to a case-by-case discussion.

4.2 Electric and Electronic Equipment (EEE) (including HVAC systems) EPD, where the EEE Products are permanently installed into the Building or Infrastructure

This chapter presents the specific requirements which apply to Electric and Electronic Equipment (EEE) (including HVAC systems) EPD, where the EEE products are permanently installed into the building or infrastructure.

¹ Of the recommendations for interpretation of EN 15804 in CEN TR 16970 some parts did not reach consensus and in consequence are not included in the checklist for verification.

Specific rules shall be provided, when relevant, into the c-PCR of the Program Operators of ECO Platform Network.

Specific rules are provided, when relevant, for products which are not used in the construction sector by the Program Operators of ECO Platform.

The EPD for EEE products that are considered as construction products shall be developed in coherence with:

- EN 15804+A2
- EN 50693
- Program Operator c-PCR

Other requirements for EEE products

Regulatory perspective

When an EPD is said to be applicable to a local context (ex. Country specific EPD), the more demanding regulation applying to the local context shall be applied for the calculations of the EPD (ex. recycled content, recovered content, by-product content), if the EPD application requires it.

Therefore, if the country regulation is less demanding than the applicable European regulation, then the European regulation shall apply; if the local regulation is more demanding than the applicable European regulation, then the country regulation shall apply, if the EPD application requires it.

Allocation rules

Information regarding specific allocation rules (rules, factors, interpretation...) which are not described either in EN 15804+A2 or in the applicable c-PCR shall be included in the EPD.

Communication of interpretation

The information shall be provided in the background report, and the verifier shall have access to it. They are usually not mentioned in the EPD, which is in line with EN 15804+A2.

Modules B

All modules B shall be presented in the EPD. Technical information for the relevant B module(s) shall be provided in the EPD.

Module B6

B6 (energy consumption) shall be added in the calculation of EPD of final products which are consuming energy, directly or indirectly (ex. a cable is consuming energy through dissipation/losses in the cable when electricity goes through it).

B6 shall be presented separately to let users of the EPD accommodate the calculation when appropriate.

If there is no c-PCR available the program operator may provide a justified use scenario to apply for each family of products (or Product Category) that it covers within its program, 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 (see also "regulatory context").

Module D

Module D shall be calculated.

When program instructions do not cover module D, EN 15804+A2 requirements shall apply.

4.3 Other Agreements

4.3.1 Mandatory calculation biogenic carbon both in kg C and kg CO2 equivalents

In EN 15804 Table 9 makes the calculation of biogenic carbon in kg C mandatory, the conversion factor to kg CO2 equivalents shall also be given in the table.

The following table is an example how biogenic carbon could be declared for the different modules. In EN 15804+A2 biogenic carbon indicators are mandatory, information for kg C as per Table 9 to be given. The indicators can be expanded according to this list which is adapted from ISO 21930:2017.

RESULTS OF THE LCA – BIOGENIC CARBON per functional or declared unit																			
Parameter	Unit	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	
Removals and emissions associated with biogenic carbon content of the bio-based product	[kg CO ₂]																		
Emissions from calcination and removals from carbonation	[kg CO ₂]																		
Removals and emissions associated with biogenic carbon content of bio-based packaging	[kg CO ₂]																		
Net emissions from combustion process of waste from renewable sources in A1-A3 *	[kg CO ₂ -Eq.]																		
Gross emissions from combustion of waste, primary and secondary fuels from renewable sources in A1-A3 *	[kg CO ₂ -Eq.]																		

* Example: In cases where the end-of-waste state cannot be defined unambiguously like for combustion of secondary fuels or waste in a cement kiln, the net values are calculated as the GWP [kg CO₂-Eq.] for the gross emissions, produced by the total renewable input (e.g. secondary fuel and waste input), minus the GWP of the emissions produced by the waste input from renewable sources.

4.3.2 Statement of location and number of sites in EPD

For an EPD from a manufacturer or reseller, the location of all the manufacturing sites for which the EPD is representative shall be listed in the EPD at least at country and city level.