

General Programme Instructions

for The Norwegian EPD Foundation

Appendix G



epd

Appendix G - Requirements in connection with the verification, approval and use of LCA tools when creating EPDs

This appendix specifies the requirements for developing a life cycle assessment (LCA) tool, including routines, processes, knowledge and documentations required. The goal of a LCA tool is to meet the need for streamlined production of EPDs for multiple products and to allow the user to publish EPDs on demand.

A verification checklist for LCA tools is published on EPD-Norge's website.

Fees for the verification of LCA tools and associated administrative costs for any additional aspects are published on EPD-Norge's website.

1.1 General

Companies have indicated a desire to simplify the process of creating environmental product declarations and reduce the amount of work in collecting data, performing LCAs and creating EPDs for similar product types or from the same company by using an LCA tool. It is of importance to make the verification process less demanding in terms of time and resources, whilst at the same time complying with the requirements of the EPD programme. In order to accommodate these wishes, the Norwegian GPI is handling these demands by introducing the concept of LCA tools for creating EPDs. **EPDs created using these tools shall have the same quality as EPDs created without tools.** Therefore, additional quality checks are introduced for the tools.

LCA tools approved of by EPD-Norge are divided into the following three alternatives:

- **Background LCA data tool:** as a prerequisite for ready-made and approved upstream LCA data
- **Reference flow tool:** as above but also includes a bill of materials (BoM) describing an assembly product or a recipe for a single product
- **Process certification tool:** as above but also includes a management system that allows the company to internally approve and issue new EPDs for registration.

The flowchart below shows the process for creating EPDs via four possible routes (e.g. no tool, background LCA data tool, reference flow tool and process certification tool). All routes are based on the flowchart of the verification process shown in Appendix B, section 2.

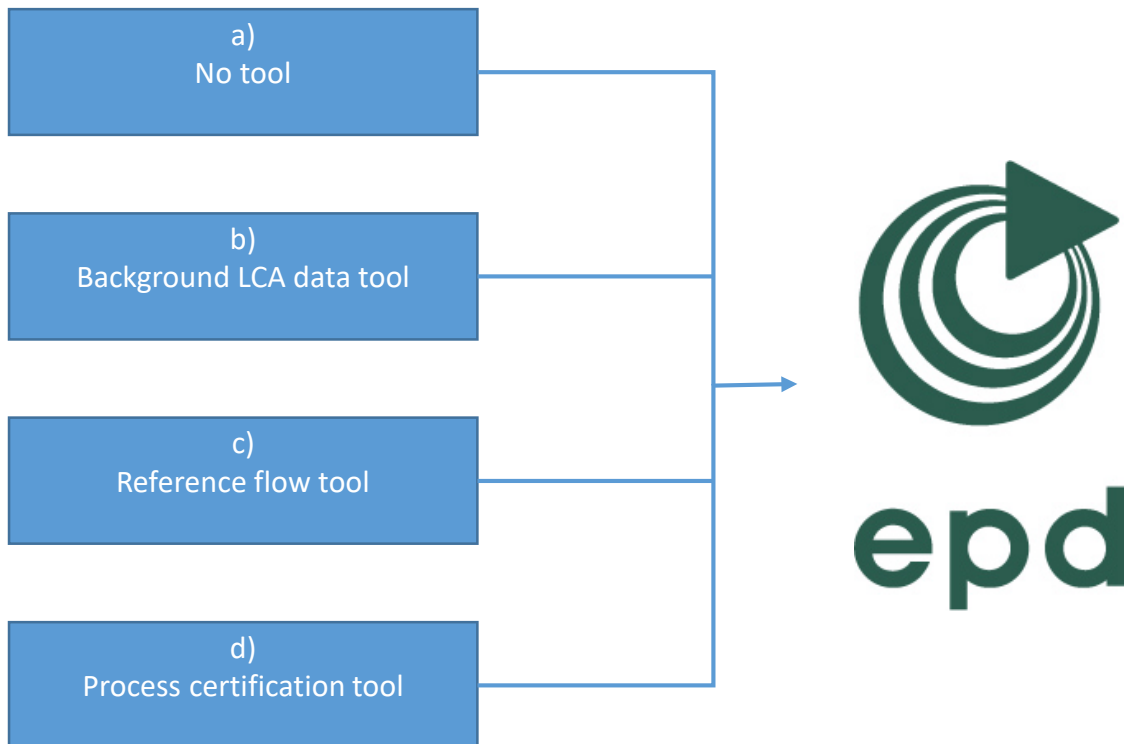


Figure 1: Four options for creating an EPD

2 A modular and step-wise approach

The three types of LCA tools outlined in Figure 1 allows companies to streamline their work in a stepwise approach, whereby the most ambitious companies will aim for the implementation of a process certification tool. An overview of the different types of tools is provided in Table 1.

Table 1. An overview of the different types of LCA tools considered by EPD-Norge.

	LCA restrictions	Internal competence	Outcome
Background LCA data tool	Fixed and verified LCA data and EPD-template	Production and product knowledge	EPD with pre-qualified background data and independent verification of each EPD
Reference flow tool	Fixed and verified LCA data and EPD-template	Production and product knowledge	EPD generator with independent review of each EPD
Process certification tool	None	As above and LCA expert	EPD generator with third party review of the process

The common Plan-Do-Check-Act (PDCA) cycle for all tools supports the working process outlined in Table 1. The PDCA cycle includes several processes that have to be implemented, see Table 2. These processes are common regardless of which LCA tool is chosen, and thus form expandable modules that allows the user of the system to build upon from a background LCA data tool, and expand it to a reference flow tool and finally, if needed, run the system as a process certification tool.

Table 2: An overview of the common PDCA cycle for the expandable modular approach

Plan	Do	Check	Act
<i>All tools</i>			
Develop: <ul style="list-style-type: none"> • A generic LCA report • A generic EPD template • A user guideline for LCA database validity And, define internal functions with defined responsibilities and competency requirements during the EPD developing process. The process owner shall be named, and a flow chart drawn and established. If knowledge is outsourced, (such as the LCA DB) a support agreement is also required	<ul style="list-style-type: none"> • Calculate a LCA • Produce the EPD 	<ul style="list-style-type: none"> • Perform a review of each EPD 	<ul style="list-style-type: none"> • Make improvements to the EPD if required • Make improvements to the database if required • Make improvement to the guidelines if required • Publish the EPD
<ul style="list-style-type: none"> • Implement a log book 	<ul style="list-style-type: none"> • Maintain the log book 	<ul style="list-style-type: none"> • Maintain the log book • External review on a yearly basis may be required 	<ul style="list-style-type: none"> • Maintain the log book
<i>Additional requirements for the reference flow tool</i>			
<ul style="list-style-type: none"> • Develop a user guideline for handling and maintaining the bill of material or recipe 			
<i>Additional requirements for the process certification tool</i>			
<ul style="list-style-type: none"> • Develop a user guideline for handling aspects and functionalities in the tool that are not covered by the other requirements given in the underlying tools specified above • Implement the EPD tool in a management system 			

Different audits are required for the different types of LCA tools and for the different processes or modules in the system:

- Background LCA data tool, annual requirement: Review of the logbook by an approved verifier, in accordance with the checklist for LCA tools.
- Reference flow tool, annual requirement: Independent third-party verification of a test EPD, in accordance with Checklists B and C.
- Process certification tool, annual requirement: Independent third-party verification of a test EPD, in accordance with checklists A, B and C.

Roles and stakeholders:

- EPD owner: Company manufacturing the product and owning the EPD.
- LCA expert: Internal or external to the EPD owner.
- Verifier: Approved by EPD-Norge.
- Reviewer: Independent internal or external reviewer, with specific tasks (e.g. check the BoM and EPD against a checklist for the reference flow tool). Independence must be documented.
- EPD-Norge: Registering of EPDs.
- Technical committee: Approval of EPD tools. Approval of verifiers.

2.1 Specifications for the different types of LCA tools and working processes

2.1.1. The background LCA data tool

The 'background LCA data tool' is the first step in simplifying the EPD creation process by standardising the creation of the underlying LCA for the company that has the goal of publishing a number of EPDs that are more or less founded upon the same raw materials. The core processes require specific data that typically varies dependent on what kind of product is delivered and subject for an EPD, see Figure 2.

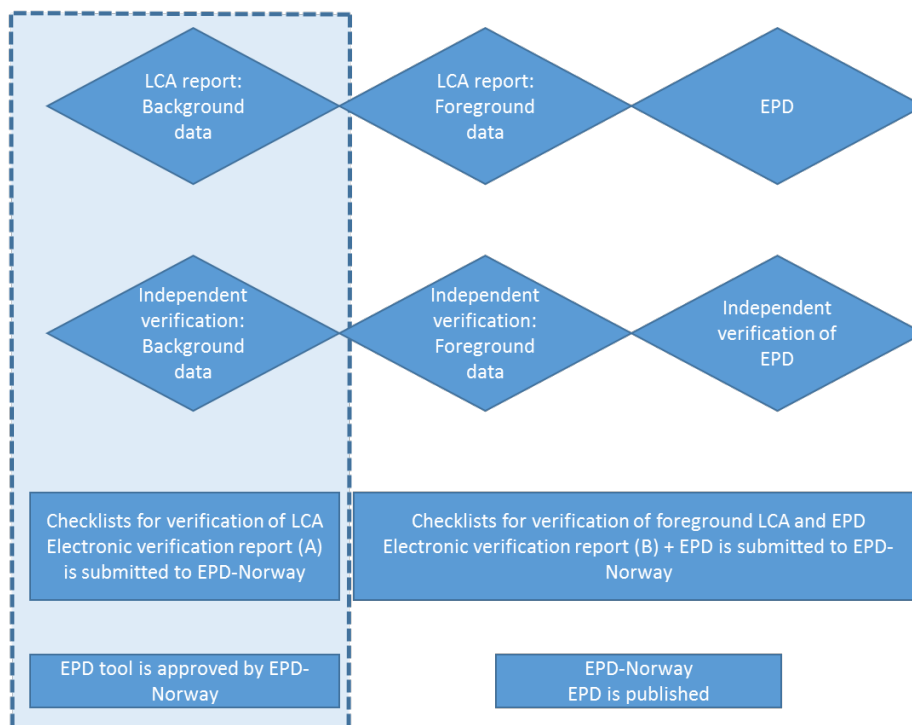


Figure 2: Background LCA data tool

This approach means that each EPD requires a life cycle inventory (LCI) for the core processes that has to be verified for each EPD created, but the upstream background data are pre-qualified, since they are already reviewed and approved by an approved third-party verifier. The reviewed upstream data sets create a common database covering all upstream data needed for several products from the same producer or construction works from the same company.

The background LCA data tool requires an initial review by an approved third-party verifier. This verification will be valid for a period of three years. If core LCA data are updated on an annual basis, then the period of validity can be extended to up to five years. If updates are required to use the database during this period, e.g. if a background data is missing, changed or fails to meet the acceptable time limit of 10 years, a supplementary verification on this matter is required. A logbook needs to be established for the LCA data tool, where all changes can be traced so that a third-party approved verifier can approve each change as and when they occur. The resulting EPD from a LCA data tool is verified as an ordinary EPD, using verification checklist B.

2.1.2 The reference flow tool

A 'reference flow tool' is an extension of the 'background LCA data tool' and is applicable if the outcome from the tool covers the full LCA reported in the EPD. The reference flow (ISO 14040) defines the scope of the full LCA, namely the processes and amounts used. The reference tool is hereby divided into two types:

- **Bill of material (BoM) + production processes, typically describing an assembly product**
- **Recipe + production processes, typically for a single product.**

The LCA for an EPD may include a BoM or a recipe or both. Both the BoM and the recipe approach include a need to map each resource or process in the BoM with processes from the LCA database. This so-called cross reference work must be documented and reviewed, see Figure 3.

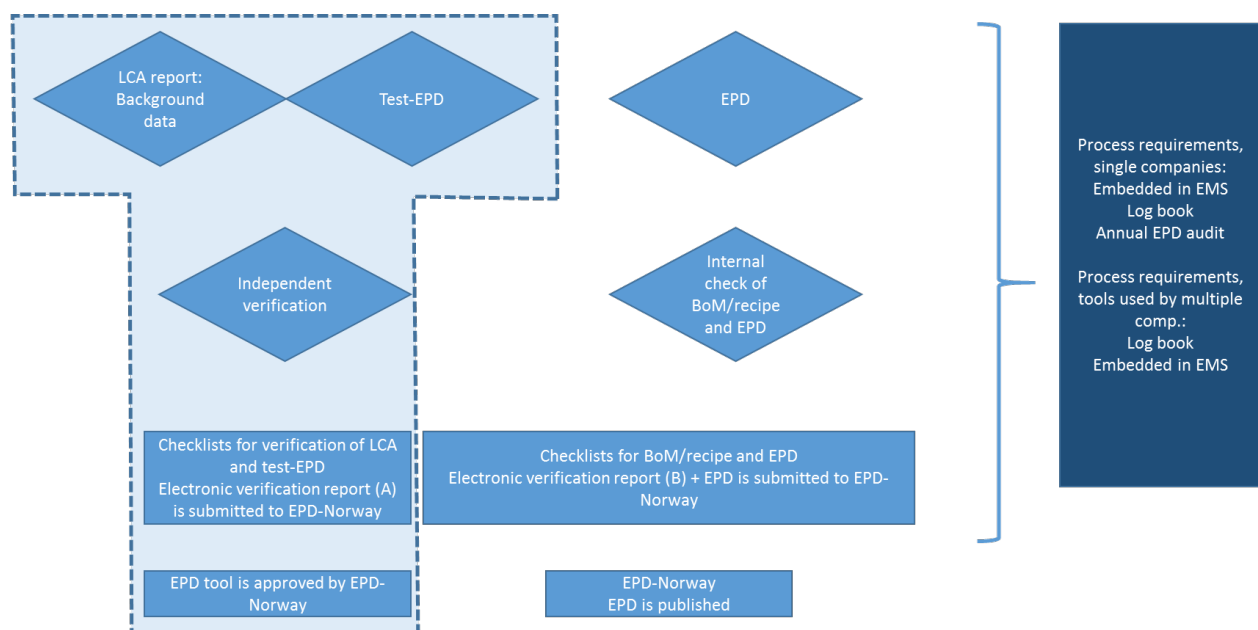


Figure 3: Reference flow tool

The BoM approach (as defined above) includes flexibility and accounts for different reference flows mapped in the LCA database, while a recipe (as defined above) has a fixed mapping between the reference flow and the LCA data. Note that the recipe approach may be handled with the parameter functionality implemented in different LCA software but can also be found on a simple spread sheet or any application suitable for this work.

Inputs and outputs from the manufacturing processes (e.g. energy use and wastes) shall also be included in each approach, with reference flows mapped to the production processes. Where it is not possible to avoid allocation between co-products, the provisions in the applied PCR shall be followed.

To generalise the use of these two alternatives, the BoM is typically suitable for describing an assembly product (e.g. a piece of furniture, a building etc.) that consist of different products that are assembled to a final product in a manufacturing step (i.e. often with limited impact compared to the upstream impacts). The recipe approach is typically used in a manufacturing process whereby the same raw materials are used, but mixed differently batch wise for various individual products (such as concrete, asphalt or paint etc.).

The 'reference flow tool' utilises a 'background LCA data tool'. This means that the upstream data is pre-qualified for the LCA. The requirements valid for the 'background LCA data tool' are therefore also valid here. Nevertheless, the initial mapping between the LCA data in the tool and the BoM or the recipe requires an additional review performed by an approved third-party verifier. This initial mapping review will be valid for a period of five years. A logbook is required to document updates as and when they are performed. In addition to the verification of the tool, an independent reviewer shall have the following tasks:

- In the case of the BoM approach, the independent reviewer needs to check the mappings performed (since it varies from EPD to EPD) and check the resulting EPD. However, the review work is more limited compared to a traditional EPD verification. By running the 'reference flow tool', the quality of the EPD is always verified by an independent reviewer.
- In the case of fixed mapping structure such as in the recipe approach, the background LCA will be pre-qualified when running the tool. A very limited review is therefore needed by an independent reviewer in order to accept and submit the EPD to EPD-Norge.

The independent reviewer shall have production and process knowledge but may be either an internal or external reviewer to the owner of the tool (external: e.g. an approved user in a similar company or in an industry organisation).

The 'reference flow tool' can be developed either by a single company or by multiple companies (e.g. industry organisations). Tools that are used by multiple companies will lead to comparable EPDs that reduce the possibility for systematic error in the use of the tool within one company. An annual EPD audit is required to ensure the quality of the EPDs. This is an ordinary verification of one EPD per year (random sample). EPD-Norge may perform additional tests if needed.

The final EPD approved by the reviewer will be submitted to EPD-Norge.

If the company wants to publish EPDs without a third-party review for each EPD, then the 'process certification tool' is recommended.

2.1.3 The process certification tool

The goal of a process certification tool is to implement a management system that allows the company to internally approve and issue new EPDs for registration. This approach will facilitate for increased implementation of environmental/quality management systems in many companies and facilitate this work to establish robust internal follow-up routines for the verification of EPDs from LCA tools. Good internal routines will make the collection and conversion of company-specific data for EPDs using the tool more rational and less expensive compared to a full LCA study, see Figure 4.

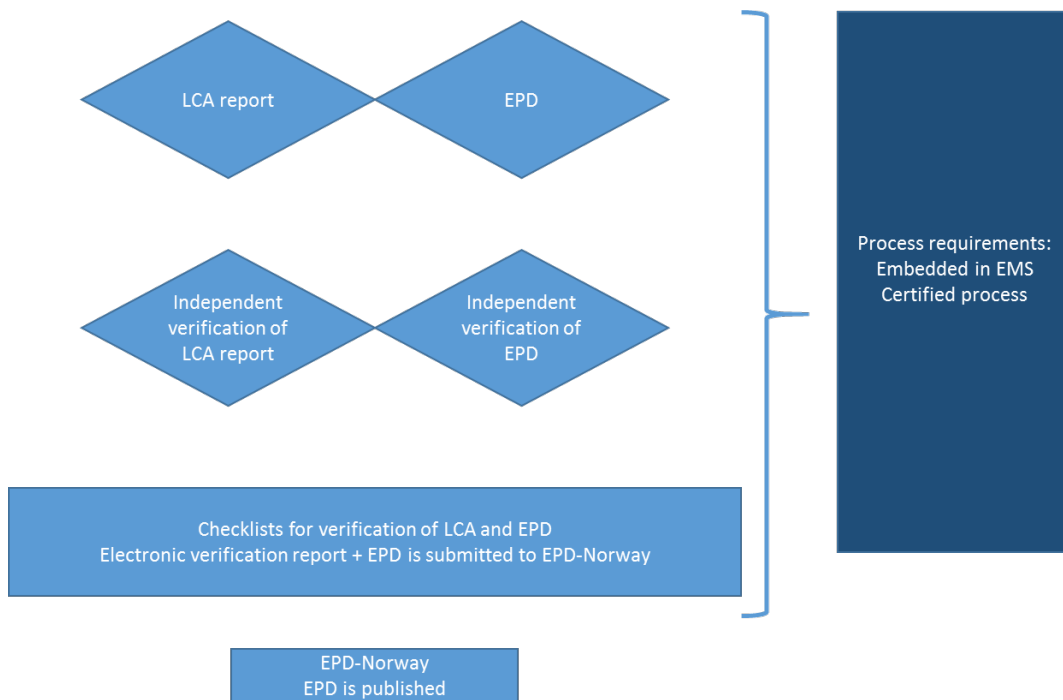


Figure 4: Process certification tool

The 'process certification tool' compared to the other tools adds management requirements based on the well-known Plan-Do-Check-Act (PDCA) cycle. The four phases in the Plan-Do-Check-Act Cycle involve:

Plan: Identify and analyse the problem.

Do: Develop and test a potential solution.

Check: Measure how effective the test solution is and analyse whether it can be improved in any way.

Act: Implement the improved solution fully.

An issue with LCA is that it is hard to foresee all eventualities and ensure that all inputs and outputs are correctly documented. A process certification tool requires a clear structure. Any changes made require third-party approval.

The process certification tool is the most qualified way for a company to produce several EPDs and frequently update them. This approach facilitates the use of other tools established by EPD-Norge, e.g. related to digital EPDs. This structure also supports the company to implement EPDs systematically.

The process system tool will be reviewed annually, all actions made from the internal review, and changes compared to the accredited management system will be documented in a logbook. This logbook will also form the basis for the yearly review. Every third review will demand a deeper review that verifies the management system and assess if it is still suitable or if changes need to be made. EPD-Norge's approval of process certification tools is unique and the structure using the PDCA-cycle and logbook will support continuous improvements of the system over time.

A company running the certified process tool approach will publish EPDs by submitting the EPD from the internal LCA expert directly to EPD-Norge (i.e. without a third-party verifier as for traditional EPDs). This requires an implementation of a system logbook and a suitable management system. Such a system will be reviewed by an LCA reviewer and approved either by an accredited body or by the Technical Committee (TC). This approval will be founded on the LCA reviewer's LCA report and a description of essential parts of the management system and its routines. The company handling the process certification tool is solely responsible for the quality of each EPD published. Such a management system will be externally reviewed upon commencement, the log books will be reviewed annually and every third year the whole tool will be reviewed by a LCA reviewer. In each case, the review report shall be submitted to the approver of the system (accredited body or TC). The management system as such will be reviewed annually according to ISO 14001 or similar. In between these reviews, an internal review will be performed for each EPD developed and published, whereby comments and actions will be stored in the system logbook.

2.2 Common requirements concerning internal procedures, competency and verification in connection with the approval of LCA tools

EPD-Norge requires developers of LCA tools to ensure that the prerequisite competence is in place for the personnel who will use the tool and will, where relevant, request that training is provided or that other measures are carried out in order to achieve the prerequisite competence. EPD-Norge will maintain records concerning the training, competency and experience of users of the tool.

The following activities must be completed and documented in order to approve the tool:

- 1) A generic LCA report that covers the scope of the forthcoming EPDs must be prepared for using the data that is entered into the tool. This is not to be sent to EPD-Norge.
- 2) Verification of the LCA data must be carried out by an approved verifier (independent and third-party), who will complete and sign part A of the checklist (verification will be completed according to ISO 14025, section 8.1.3 of LCI data used in EPD generators); see Appendix 1. The fixed LCA data for use in the LCA tool must be quality-assured according to the PCR requirements, age of data (e.g. generic data must not be older than 10 years and specific data must not be older than 5 years) and system boundaries etc. The checklist must be sent to EPD Norge. The checklist must specify which PCR the tool has been verified against.
- 3) User guidelines must be prepared for the people who will use the tool. These user guidelines must describe the division of responsibility between the person entering the company data in the tool (the user) and the person checking that the correct specific data has been used (the independent reviewer). The training of independent reviewers must include an assessment of practical skills, e.g. training on finding typical errors in EPDs or an exam. The user guidelines must be sent to EPD-Norge.
- 4) All EPD tools require the use of a logbook. The logbook shall be sent to EPD-Norge annually.

5) EPD-Norge will have the possibility to perform an additional external review at any time and without any specified reason, in order to gain insight on the operation of such tools. Such external review can result in comments that requires actions to be performed in order to run the tools.

3 Information on LCA tools and EPD verification

In addition to the information outlined in the GPI, EPDs developed through any LCA tool shall also include the following information:

- Independent verification (or independent review, where applicable) of the declaration, background LCA data and final LCA result according to ISO 14025 has been performed by: Specify verifiers/reviewers name and company (that indicates if they are internal or external verifiers). Note that up to three different verifiers/reviewers may be involved, each shall be specified.

EPDs developed using a process certification tool shall also contain the following information:

- Third party verification of the management process has been conducted by: Specify the certification body and approved LCA expert. Specify if the certification body is accredited approved by EPD-Norge.

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