

## Policy Brief

# EeBGuide: Operational Guidance for Life Cycle Assessment Studies of the Energy Efficient Buildings Initiative

### Summary

As new buildings now consume about the same amount of energy during an average 50 year lifespan as it is necessary to build them, new assessment methodologies encompassing the whole life cycle of building are required. Life Cycle Assessment (LCA) studies are being used more and more by leading practitioners as a means of demonstrating the "whole life" energy efficiency of buildings. LCA studies analyse the impact of products, processes or services along the entire life cycle, which makes it a powerful tool to help companies optimise the ecological footprint of their products.

and lack of comparability. This situation forms the basis for the EU research project "EeBGuide" (Operational Guidance for Life Cycle Assessment studies of the Energy Efficient Buildings Initiative), which is coordinated by the Fraunhofer Institute for Building Physics IBP and includes leading LCA experts from PE INTERNATIONAL, CSTB, ESCI, BRE and Prof Ch Sjöström Consultancy.

The goal of the project is to define common rules which will provide a standardized methodology for LCA studies in the construction sector that can be used throughout Europe.

### Starting point

LCA studies are used for the certification of sustainable buildings and the development of Environmental Product Declarations for construction products. They are also increasingly used as a decision-support tool in building projects. The European standards EN 15804 and EN 15978 as well as the ILCD Handbook are based on the International standards ISO 14040 and ISO 14044 (see Figure 2). The European standards define the general framework and general calculation methods for product and building LCAs. The European ECO EPD platform (as an actual umbrella for national Environmental Product Declaration – EPD – programs) and national EPD programs have individual sets of rules and refer to EN 15804. Building certification schemes (like DGNB, HQE or BREEAM) again use individual sets of calculation rules for LCA in the construction sector and may refer to EN 15978.

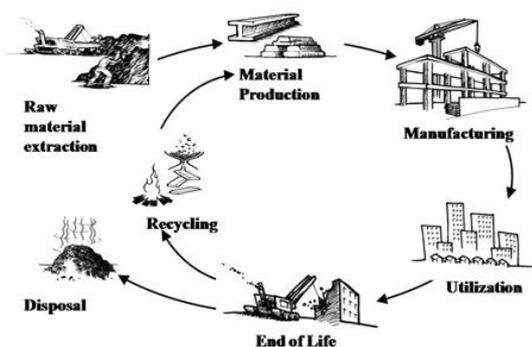


Figure 1: LCA studies analyze the impact of products, processes or services along the entire life cycle involved.

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In Europe, building LCAs are the foundation of many building certification schemes as well as of Environmental Product Declarations (EPD) for construction products, yet the metrics and standards currently used in Europe can be interpreted and implemented in many different ways leading to inconsistencies

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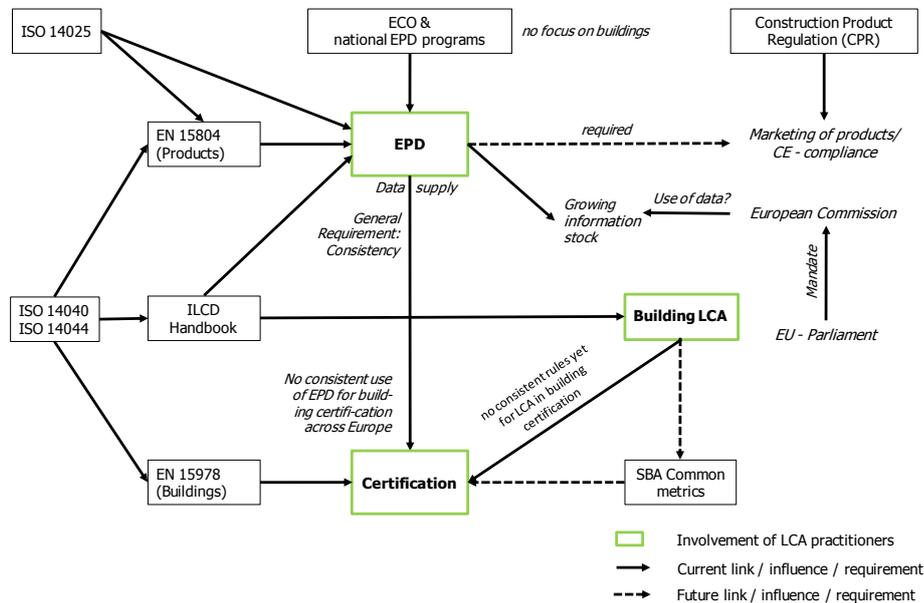


Figure 2: Current European situation in the context of EPD and building LCAs.

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As a consequence, the European landscape of LCA calculation rules is not dominated by harmonized methods. Yet EPDs are needed for building LCAs. Therefore one core requirement for such application is consistency between data supply (product data / EPD) and data use (building LCA).

## The project

To improve the reliability of LCA studies and comparability of results, the team of LCA experts is collaborating to produce a common methodology and set of rules in the EeBGuide project, which is co-financed by the European Commission's Seventh Framework Programme for Research and Technological Development (FP7) and is part of the Energy Efficient Building European Initiative. Based on existing standards and guidelines and the International Reference Life Cycle Data System (ILCD) Handbook, the project partners are currently developing a common methodology for conducting LCA studies within projects of the Energy Efficient Building Initiative. The EeBGuide

focus particularly lies on case study examples and operational guidance provided by Life Cycle Assessment experts and practitioners for an easy application.

## Objectives

One of the key project objectives is to demonstrate the applicability of the guidance in practice. Ultimately, the core elements of the guide will be published on an interactive, web-based tool. EeBGuide enables private and public LCA practitioners to quantify environmental impacts in a consistent manner. The guidance document can be applied to assess the life cycle of whole buildings (both existing and new ones), building products or technological solutions still to be developed within the E2B Initiative. It allows practitioners to perform LCAs in a clear, pre-defined and well-structured way by delivering a scientifically sound, practically applicable, and quality assured guidance.

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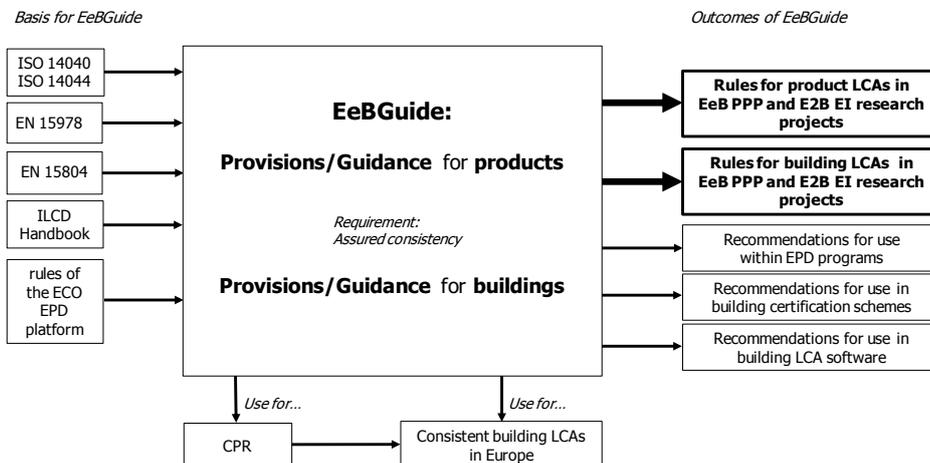


Figure 3: EeBGuide is able to establish a link between the different standards, building certification schemes, EPD programs, legislation and other items within the European context.

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The EeBGuide's impact even extends toward the formulation of Product Category Rules (PCR) as the basis for EPDs for "new" product categories. Especially the innovative solutions that are currently under development or to be in the future developed within the E2B Initiative represent "new" product categories, where either completely new PCRs have to be developed or where the EPD program may refer to the EeBGuide.

### **Impact on standards, legislation and political background**

EeBGuide will serve as a guideline for the development of directly applicable and highly operational standards and guidelines for LCA in the construction sector, and is even replicable in other industrial sectors, which will support both current and future standardization activities. This results in a generally improved quality and scientific soundness of LCA studies within the EeB Initiative and beyond and in an improved acceptance and higher reliability of LCA study results. EeBGuide will therefore allow legislative bodies to rely more on LCA as a policy instrument, to increase the usefulness of LCA studies, to improve their

relevance in decision-support and policy making and to assure decisions and policies on the basis of holistic environmental assessments.

On the European policy level, EeBGuide provides a direct link between the construction industry, the ELCD platform and the ILCD data network, and also has an indirect impact on the following elements of European policy:

- Integrated Product Policy Communication (IPP)
- The Thematic Strategy on the Prevention and Recycling of Waste
- Thematic Strategy on the Sustainable Use of Natural Resources
- The new Construction Products Regulation (CPR)
- The Lead Market Initiative for Europe on Sustainable Construction
- Sustainable Consumption and Production Action Plan (SCP)
- Sustainable Industrial Policy (SIP)

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### **Impact on European industry**

EeBGuide enhances the competitiveness of European industry by contribution to sustainable development. It supports the goal of decoupling growth from resource depletion, which is an economic, environmental, and social necessity for European industry. Assessing and improving the environmental performance of products, technologies, and services, EeBGuide delivers the framework for a consistent environmental evaluation.

### **Project partners**

- Fraunhofer-Institut für Bauphysik IBP
- PE INTERNATIONAL AG
- Centre Scientifique et Technique du Bâtiment (CSTB)
- UNESCO-Chair in Life Cycle and Climate Change of Escola Superior de Comerç Internacional (ESCI)
- Building Research Establishment (BRE)
- Prof Ch Sjöström Consultancy

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