



Development of European Ecolabel Criteria for Buildings

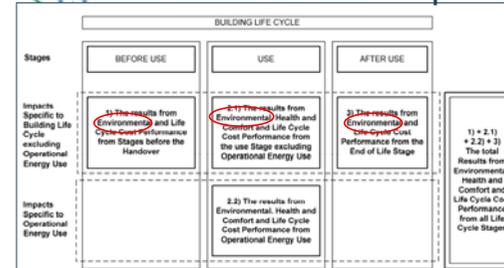
LCA of building products: materials, products, components

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Definition and scope of BP- LCA



pCENTS 15643-1:2007
 Figure 5 — The organisation of the result of the assessment to be made available for communication in accordance with the life cycle stages and the normative groups of information

Building products are goods and services used during the life cycle of a building or other construction works. (ISO 21930:2006)
 Goods/products : an item manufactured or processed for incorporation in a building or other construction works. The manufacturing or processing of the building product can occur at the factory or on the building site. (ISO 21930:2005)

- to clarify the environmental impact derived from various building elements
- to allow seeking optimal solutions for the overall impacts of a building design
- improving the environmental performance of buildings.



Definition and scope of BP- LCA

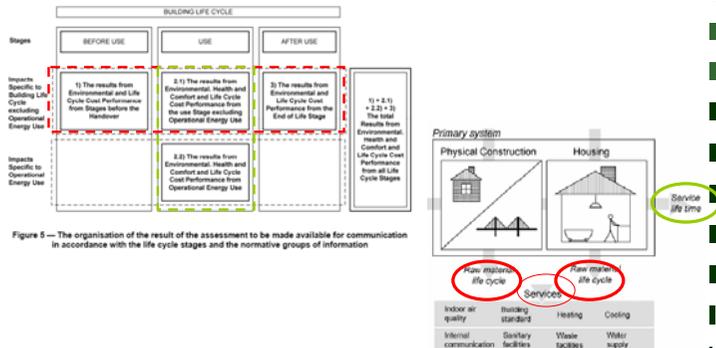


Figure 5 — The organisation of the result of the assessment to be made available for communication in accordance with the life cycle stages and the normative groups of information



Conceptual framework

Construction Products Directive (89/106/EEC)



Essential Requirements

1. Mechanical resistance and stability
2. Safety in case of fire
3. Hygiene, health and the environment
4. Safety in use
5. Protection against noise
6. Energy economy and heat retention

CPD CE-marking gives information about the performance characteristics related to the 6 Essential Requirements. It is a declaration that the performance parameters declared are true, but it is not a declaration that it complies with any member states' building regulations



Conceptual framework

CEN/TC 350 inside the concept of integrated building performance

level	Environmental performance	Social performance	Economic Performance	Technical performance	Functional performance
Framework level (TG)	Environmental Performance	Health and Comfort Performance	Life Cycle Cost Performance	Technical Description	Functionality
WG2 level	Description of Building Life Cycle				
Calculation methods for Building level (WG1)	Assessment of Environmental Performance WGT	Assessment of Health and Comfort Performance	Assessment of Life Cycle Costs		
	Use of EPD WGT				
Rules for Product Level (WG3)	PCR and Communication Formats for Environmental Product Declarations				
	Generic Data				

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Product environment requirement

The general environment requirement may be expressed as:

- minimizing the building-related environmental impacts during its life cycle.

In 1997, ISO guide for the Inclusion of environmental aspects in product standards (ISO Guide 64). This guide was implemented as CEN Guide 4 "Guide for the inclusion of environmental aspects in product standards" (formerly CEN Memorandum No. 4).

To deduce the product statements, from the expected performances of a building in its life cycle the conceptual model elaborates the needs into a hierarchical structure, which ensures that all the detailed requirements stem transparently from clear needs at its root (PeBBU SoTA 2005).

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Product regulations and conformity assessment

Précis: 2007 study to evaluate the internal market and competitiveness effects of council Directive 89/106/EEC

'Application document' as an accepted solution to 'bridge the gap' between declared performances of CE-marking and national building regulations.

Stakeholders

- State or Government, Municipality and Authority
- Institutes engaged in Standardisation, Approval, Certification, and Inspection
- Client, Design Team, Contractors; Assurance Owner, Facility Manager, End Users, Manufacturers, Suppliers

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Product regulations and conformity assessment

- There should be a European solution to the problem of application rules and approval marks (Eurocodes, ETA's 'application documents', or 'linking documents' at the European level). Elements such as types of uses, types of buildings, climatic regions, wind zones, snow zones, and the related technical classes, recommended minimum values, pass-fail criteria, etc. could be developed as European standards.
- 'Rest-norms' for construction products at the national level should be prohibited
- The position of CPD CE-marking as a product conformity mark could be strengthened

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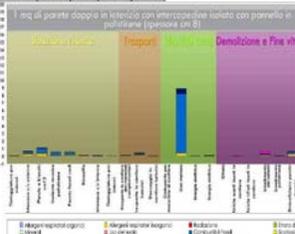
LCA - Ecolabel - EPD

Table 5.10 - Example of eco profiles of high-pressure decorative laminate (HPL) and its elements [Source: AIBT INFOTEC, 1999 (pag. 78)]

ENVIRONMENTAL IMPACT CLASS	High Pressure Decorative Laminate, 1 m ² A		Chipboard, 1 m ² B		HPL Element 1 m ² C		Total life cycle A+B+C
	Raw materials	Production	Raw materials and production	Gluing and assembly	Service Life	Waste treatment	
Acidic equivalent	12	3	47	2,09	3,1	0,42	22
Bioderivatives	0	0	0	0	0	0	0
Chlorinated hydrocarbons	4,5	1,4	79	2,00	1,2	5	37
Deposition of fine particulate matter	0,77	0,52	75	0,68	0	0,21	4,2
Energy	63	29	271	34	17	0,2051	24
Global warming	1,200	0,704					

• **Alternative Product Evaluation (APE)** a functional unit that works as a fix reference unit. Different products that satisfy the defined functional unit are then evaluated regarding their environmental performance.

• **Environmental Functional Demand (EFD)** is based on a quota decided in advance that is equal to an acceptable environmental impact divided by the function output. A number of such quotas are then set up as goals and as such constitute the starting point for the assessment procedure.



Environment product performance criteria and comparability

It is important to develop criteria for the “product stage” of a modular LCA following the indication of ISO/21930 on the basis of:

- the selection of identical PCR,
- the demonstration that omitted life cycle stages have no relevant environmental impacts or the environmental data of omitted life cycle stages are identical (same performances in use) and are adequately dealt with and that instructions on where to find this information are available.

Reductions in the number of criteria for product groups are hoped for “by focusing on the overall environmental impact of the final product, e.g. concentrating on some stages in the product life cycle or environmental hot spots (e.g. by way of a “streamlined” or “screening” LCA)”. This should be done by promoting and fostering a stronger relationship of the criteria with EU and/or national environmental priorities (see: CEN *Ecolabel final report* .2005).



Requirements for the underlying lca: PCR

In the EPD System PCR, these requirements are reported as follows:

- Requirements for the underlying LCA...
- Functional and declared unit
- System boundaries.
 - Product stage
 - Construction stage
 - Building stage
 - End of life stage
- Cut-off rules.
- Allocation rules
- Data Quality requirements
- Calculation rules.
- Characterization factors.
- Data collection
- Description of data.
- Content of substances.



Requirements for the underlying lca: Modularity and system boundaries

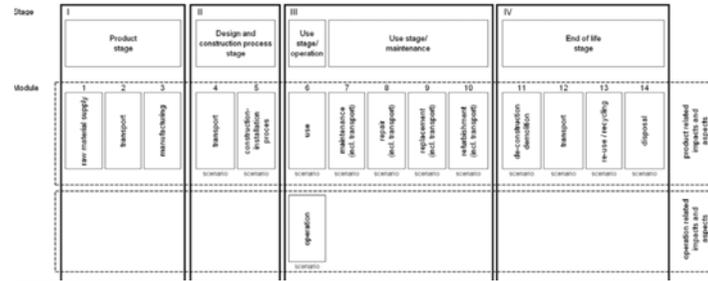
The environmental impact of the building product may be assessed for different stages of the life cycle, appropriate and justified, depending on the functional complexity of the building product or the specific way in which it is used in the building, defining the design, construction, use, maintenance and end of life scenarios.

Most frequently the Building Product LCA concerns:
product stage
product stage “with options”





Requirements for the underlying Ica: Modularity and system boundaries



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