

LoRe-LCA

Low Resource consumption buildings and constructions by use of LCA in design and decision making



Recommendations for European Standardization

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1 Introduction

One of the objectives of the LoRe-LCA Project is to support the standardisation activities of CEN TC 350 and other initiatives by taking into account the different approaches and local specificities which exist and provide input to European harmonisation activities.

A standard is a document designed for common and repeated use, to be used as a rule, guideline or definition¹. Standards are voluntary, consensus-based and as such do not impose any regulations. They provide test specifications and test methods (interoperability, safety, quality, etc.). The benefit of standardization lies in increased product safety and quality for consumers and in lower transactions costs and prices within the European market for manufacturers.

The three European standardization organizations are:

- CEN, the European Committee for Standardization,
- CENELEC, the European Committee for Electrotechnical Standardization and
- ETSI, the European Telecommunications Standards Institute

The international standardization organization is

- ISO, the International Standardization Organization

CEN produces voluntary European Standards (ENs). These standards have a unique status since they are also national standards in each of CEN's 31 member countries. With one common standard in all these countries and every conflicting national standard withdrawn, a product can reach a far larger market with much lower development and testing costs.

Most standards are prepared at the request of industry. The European Commission can also request the relevant standards bodies to prepare standards in order to implement European legislation. This type of standardization activity is “mandated” by the European Commission.

The application of standards is voluntary. However, laws and regulations may refer to standards and even require compulsory compliance. Within the European Union, Directives, Regulations and other EU legislation may refer to European Standards. In particular, this is the case within the framework of the “New Approach”². “CE marking” represents a declaration that the product conforms to all applicable European legislation.

¹ Part of this chapter is taken from www.cen.eu / FAQs (accessed in November 2011)

² The “New Approach” was first created by the European Council in May 1985. It is the means by which open, voluntary standardization can support regulations concerning products on the European market. Since then, European Union Directives define “essential requirements” (e.g. related to health, safety and environment) that products (not only construction products) must meet before they can be placed on the European market. In these circumstances, manufacturers may choose any technical solution that fulfils the essential requirements. If they follow the relevant harmonized European Standard(s), they benefit from a “presumption of conformity” to the essential requirements set out in the Directive. If they choose their own method, they must provide a “technical file”, which sometimes must include reports from recognized testing agencies that they are in conformity with the relevant Directive.

Standardization plays an important role in sustainable development efforts as it influences the design of products and processes. Standards can e.g. define acceptable energy-use levels, waste management procedures and other environmental protection measures. CEN has developed a “toolbox” known as the Environmental Framework to support Technical Committees (TCs) in the inclusion of environmental aspects in the development of European standards. The toolbox includes, apart from training materials, the CEN guide 4 “Guide for addressing environmental issues in product standards”. This guide is committed to life-cycle-thinking i.e. it advocates the avoidance of adverse environmental impacts at all stages of the product’s life-cycle.

The most important standardization activity in the field of sustainable construction is the ongoing work of CEN TC 350 (“Sustainability of construction work”) which is in the centre of the following recommendations. But several TCs that are engaged to develop standards for products or for product groups (in the following chapters termed “product TCs”) are addressed as well. ISO has decided to update its standard ISO 21930 on EPD for construction products. The work will start 2012, with the main aim to close the gap between requirements, e.g. PCR requirements set up in the ISO and the CEN standards, respectively.

Recommendations are directed to the European level but it is becoming increasingly important that also the national level, as well national standardization bodies and national mirror committees are providing information and guidance for their companies. Specifically, SMEs should be addressed and offered assistance in implementing these sustainability standards.³

As an example for promotion and for continuous improvement of EPDs the European platform “ECO” should be mentioned. It was initiated in autumn 2011 as a cooperation platform of EPD systems with the aim to support the merge of existing EPD formats into a common European format. Its objective is also to facilitate the implementation of EN 15804 and at the same time encouraging a regional language and regional demands⁴.

It should be noted that standardization is not in contradiction to strategies proposed by eco-design and the Eco-design Directive or of procurement and the Green Public Procurement Initiative. Standards of CEN TC 350 could even gain more relevance when referenced by European policies.

³ Recommendations are partly based on the results of a CEN WS held on 22 March 2010 (see final report of the “Workshop on construction sustainability assessment standards: the interface between CEN/TC 350 standards for assessment of environmental performance (product and works level) and standards for products and for construction works”,
<http://www.cen.eu/cen/Sectors/Sectors/Construction/Events/Pages/TC350workshop.aspx>)

⁴ Schmincke, E.: „European EPD, an information tool for performance oriented building assessment”, Proceedings of the World Sustainable Buildings Conference 2011 (SB 11), Helsinki 2011.

2 Recommendations on product level

- To ensure a broader use and dissemination of EPDs, as well as a better public understanding, an intelligible Business-to-consumer format is needed. Consumers don't want to puzzle about numbers but want to be informed about issues they are concerned. Standardization needs to propose indicators for the possible areas of concern (which indicators are most meaningful, which areas of concern are covered, are indicators put in the adequate context, etc.). Further research is needed on the selection of indicators from the social point of view. There is a work item in CEN TC 350 which should be activated.
- Issues of concern of many people are toxic or hazardous effects that a product may induce. So human- and eco-toxicity should be given as indicators in the EPD in a 2nd generation of standards.
- EN 15804 sets up the core PCR of construction products. Sector PCRs are set up within EPD systems; so, within the future, also sector PCRs will need harmonisation.
- A possible role for product TCs (CEN Technical committees for product standards) could be to translate the horizontal EN 15804 into product type specific and more detailed rules. For this, TCs need a clear picture of what environmental or sustainability aspects are required to be declared in the future, with regard to the intended use of their product. As a starting point for energy and for climate change requirements EPDs could be included in technical certification schemes/technical approvals.
- The scenarios to be used within LCA should further detail: What is generic, what is defaulted, what is specific to product families and what is individual to a product. Some companies manufacture thousands of products but only have average data of their production. Voluntary scenarios for the construction processes, transport, installation, use stage, e.g. replacement and end of life have to be determined together with manufacturers. Scenarios should, if possible, be fixed for entire families of products. So on product level standardized scenarios should be defined (as part of the PCR) that the user (product TC or client) can choose. It is an open question for which issues 1 generic scenario is enough. E.g. several transport scenarios could be provided for sensitivity analysis because it is often not known where products originate from.
- EPDs should be ready to be added to a database that is accessible for different tools throughout Europe, like ILCD databases (valuated by ILCD). Interoperability should be encouraged.
- There is still the barrier due to the various data sources (different regions, producers or countries of materials) that create an unreliable data-base. In addition, the uncertainties pertaining to the application of the LCA building methodology can lead to different results and interpretations. Further research and subsequent stakeholder processes will be necessary to agree on key questions like the functional unit, system boundaries, appropriate data for standard situations and standardized impact matrix, etc.

- Until now it has not been required that the EPD do a periodical update of data. Third party verification has also not been mandatory. There have to be further commitments in this area to foster the use of EPDs in regulation (e.g. in future CE-marking). E.g. data should be updated at least every 10 years. This has to be included in EN 15804 and in ISO 21930. 3rd party verification could be a requirement of databases.

3 Recommendations on building/construction level

- It is a matter of fact that in the construction sector many sustainability issues are raised. Often these are even perceived as urgent problems (climate change, etc.). Standardization has to provide methods for a systematic approach and characterisation sometimes even ahead of “generally accepted practices”. Thus, sustainability standards need continuous revision and further development that keeps up with science, innovative products and processes and also with the needs of all stakeholders. CEN TC 350 standards should be continuously updated (2nd generation of the standards).
- There are several additional topics like human health and biodiversity that are especially meaningful for users of buildings (inhabitants, staff, etc.) and policy makers. Standardization (and research) is needed for future generation of standards.
- Health and toxicity are issues that should be dealt with in the next generation of standards. However, it will be a topic over a longer period of time because research developments in indicators and methods for calculation have to be incorporated continuously.
- LCA for EPBD: There are numerous energy related indicators in EN 15978 (use of non-renewable / renewable resources other than raw material, use of non-renewable / renewable primary energy as raw material, use of non-renewable / renewable secondary fuels, etc.). These indicators do not correspond with those considered in EPBD in several respects. Harmonization should be sought and has to cover methodological choices and clarifications. Some possibilities are the following:
 - Choosing an adequate split between renewable and non renewable energy,
 - Choosing between net and gross calorific value,
 - Allowing a global balance and optimisation including both materials and energy. As a consequence of the latter an overall optimization for the building is possible. Whereas in EN 15978 the split between energy and materials does not allow e.g. to compare a more efficient insulation material with higher fabrication impacts to a low impact material but leading to higher losses and operation energy consumption. The same is also true for renewable energy systems (exported energy versus material fabrication).
- Develop standards also for engineering construction works (like roads, bridges, sewage plants, etc.). The variety of different structures has to be classified e.g. linear structures like roads versus other structures. New and existing construction works could require different methods. Scenarios that enable a decision on alternatives have

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to be standardized, as well for erection (new structures) and renovation (existing structures). EPDs for construction products need to be looked on in this context.

- A standardization of building scenarios might facilitate a broader uptake of building assessment. Standardized scenarios could be developed for each country in a technical report or a guideline. It could serve as a starting point for discussion with clients or for sensitivity studies.