

Life Cycle Assessment (LCA): a useful tool, but to handle with care

Introduction

Increasingly, the focus of politicians, policymakers and industries lies on sustainable development seeking a delicate balance between environmental, social and economical aspects. Life cycle analysis is frequently promoted as a tool to assess environmental impact. While LCA studies are a useful tool, this instrument needs to be handled with care, particularly when used for policy-making purposes.

The European Aluminium Association has commissioned a study to analyse four specific LCA exercises in 4 European countries. Two of these four cases concern policy-making in the packaging sector: the well-known “UBA II” in Germany (case 1) and the packaging tax in Denmark (case 2). The 2 others deal with legislative action related to the building sector: the Dutch MRPI initiative (case 3) and the Swiss case on the environmental declaration of building products (case 4).

CE Delft, as an independent research and consultancy agency specialised in developing structural and innovative solutions to environmental problems, carried out this in-depth analysis from which several recommendations have been drawn up. These recommendations will help politicians and policymakers to commission, interpret and use properly any LCA study. These recommendations are issued from the final CE Delft report, which can be downloaded from www.aluminium.org

Recommendations

1. Any commissioned LCA study has to be done according to the **EN ISO 14040-series standards**.
2. An independent **critical review panel has to control the LCA study**.
3. **All involved stakeholders** have to take part in the entire LCA process, e.g. from the very early stage to the executive summary.
4. A **preliminary consensus on all key aspects, especially on value-driven choices**, needs to be reached before the LCA study starts.
5. For comparative purposes, not only the **functional unit** of the product system has to be properly chosen but a **comparability assessment** must be included in the study.
6. A proper method needs to be used to take into account the **recycling abilities** of the product system.
7. **Weighting issue**: the ISO standards do not allow weighting in comparative LCA's disclosed to the public. An LCA has to end with **several indicators but not with one figure**.

1. ISO standards for LCA studies

An LCA or Life Cycle Assessment is a scientific tool for the evaluation of environmental effects of products or services throughout the complete life cycle, literally: “from cradle to grave.” This involves the extraction of raw materials, refining, fabrication transportation, use, recycling and disposal, both of the product and the energy and ancillary materials supplies. The LCA methodology is described in the internationally accepted EN-ISO 14040 series, accredited by the European Committee for Standardisation (CEN). These standards reflect the state of the art methodology of the LCA which is generally accepted amongst the LCA practitioners. As a result, **any LCA study, especially those commissioned for legislative purposes, has to be performed according to these standards.**

2. Critical review panel

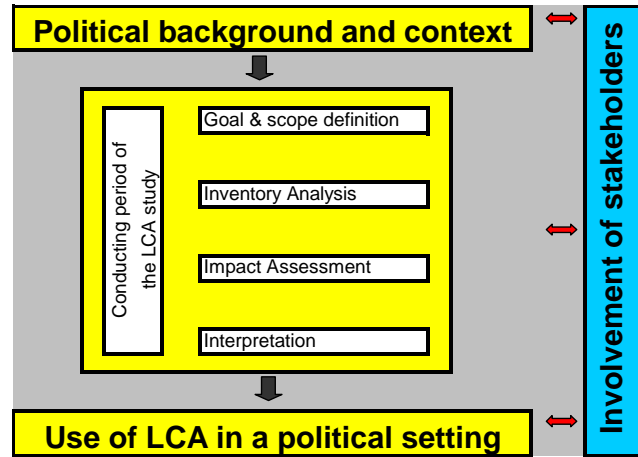
As mentioned in the ISO standard, **an independent critical review panel needs to be involved at the very early stage of the LCA study**. This review panel has to guaranty the quality and the objectivity of the LCA study.



3. Involvement of stakeholders

A strong involvement of stakeholders is essential in the acceptance of the LCA results. This involvement is important during the whole LCA process: from the starting phase leading to the commissioning of the study through to the ending phase consisting generally in writing the executive summary. Even if this last phase is very often disconnected from the LCA process itself, the participation of all stakeholders at this stage is particularly crucial. Indeed, this document not only frequently circulates in the public domain but it also usually constitutes the main basic document supporting the political decision. Any unjustified statement or decision resulting from inappropriate or biased LCAs can be very harmful both for the industry and for the environment.

The participation of representatives of all stakeholders in the whole process is necessary in order to facilitate the acceptance of the LCA results.



4. Preliminary consensus on value-driven choices

The case study analysis pointed out some key aspects that require special care when conducting an LCA. Although the LCA methodology aims for a high degree of scientific objectivity, all LCA studies make subjective value-driven choices, which may be decisive for the outcome. These value-driven choices are part of the goal and scope definitions, which are essential elements governing the complete LCA study.

As a result, it is also important that **a preliminary consensus between all stakeholders on key aspects, especially the value-driven choices, is reached before the LCA study starts.**

The next three points highlight some critical aspects on which this preliminary consensus was not systematically reached in the four practical cases under study.

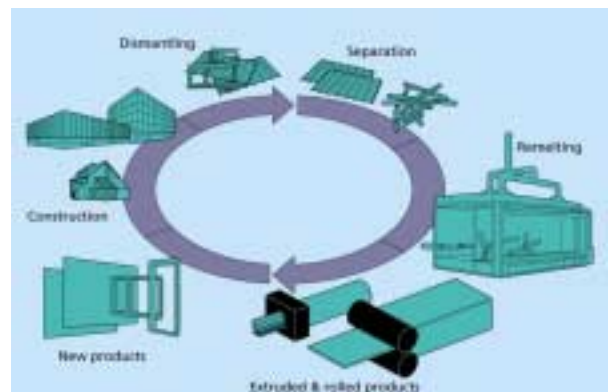
5. Functional unit and comparability assessment

The functional unit is the key element allowing the practitioner to perform the LCA calculations. **In comparative LCA studies, the choice of the right functional unit is crucial** and can lead to intensive discussions. The following example in the **packaging sector** illustrates this issue: an LCA study on “beverage can” product system cannot use one kilogram of packaging material as functional unit but has to use a more appropriate unit as grams needed per litre of drink. In this sector, it is questionable if a 33cl beverage can is comparable to a 1.5 litre bottle taking into account the different purposes and properties of the 2 product systems. Not only the packaging material needs to be taken into account but also the quantitative and qualitative functionalities of the packaging, e.g. preservative properties vs. type of beverage, volume capacity, transportability, design, etc.

ISO standards require an assessment of the comparability of the studied product systems before making public any comparative assertion coming from an LCA study.

6. End-of-life and recycling

Used aluminium is an important resource that is highly valuable. For this reason, it is rarely lost. The quality of aluminium is not impaired by recycling -it can be repeatedly recycled and remelted. In fact: the life cycle of aluminium products has to be conceived “from cradle to cradle”, instead of “from cradle to grave”. LCA practitioners have developed a number of methods to deal with recycling. These are allowed within the ISO framework providing the choice of method is justified and made transparent. The method can influence the result of an LCA decisively. Therefore, it is recommended **to use a proper methodology to take into account the recycling abilities of the product system under study.**



7. Weighting issue and Indicators

“Weighting” is the process in which the various indicators, resulting from an LCA study, are aggregated in one figure (or a limited number of figures) through the use of subjective weighting factors reflecting the importance of each impact category. The aim is to facilitate the decision making process by reducing the amount of indicators. LCA practitioners have developed a variety of weighting techniques and methods. These suggest a high scientific nature. However, it is not science. Weighting is about making political value choices, which have to be clearly and explicitly communicated at all times. For this reason, **the ISO standards do not allow weighting in comparative LCAs disclosed to the public. As a result, any LCA study has to end with a certain amount of indicators but not with one figure.**