LIFE CYCLE ASSESSMENT (LCA)

GUIDANCE FOR PACKAGING CHAIN COMPANIES

EUROPEN

EUROPEN is the cross sectoral voice for Packaging and Packaged Goods in Europe. It is an industry and trade organization open to any company with an economic interest in packaging. EUROPEN's twin goals are to secure a fully accessible European market for packaging and packaged products without obstacles to trade and distortions and restrictions of competition, and to achieve a balanced view of the role and functions of packaging and related environmental aspects.

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Guidance for Packaging Chain Companies

OBJECTIVE
The purpose of this guide is to provide companies in the packaging chain with some practical guidelines that may be helpful when considering entering a LCA project.

The document is intended to provide information and guidance on important issues, which should be considered in the decision making process and raise awareness of certain issues. It is not the objective of this document to predetermine or restrict the decision of individual members of the packaging chain.

WHAT IS LIFE CYCLE ASSESSMENT?
Life Cycle Inventory (LCI) and Life Cycle Assessment (LCA) as a management tool has been harmonized under the ISO standard procedure and more detailed and precise requirements can be found in the ISO Standards 14040-43. Applying the ISO requirements helps ensure a consistent approach but is, however, not a guarantee for a scientific outcome of the results.

The CEN Report CR13910 on "Criteria and Methodologies for Life Cycle Analyses of Packaging" focuses on packaging related issues that are of particular critical nature when the elements of the packaging and distribution chain are assessed.

LCI/LCA address resource utilization and potential environmental burdens from "The cradle to the grave" for the production and use of a specific product or system for a defined period of time with given conditions for production, transportation, use and recovery.

The inventory procedure is a databased process of quantifying and classifying energy and raw material requirements, emissions into air and water, solid waste generation and other environmental burdens occurring throughout the life cycle of a product or a process.

The assessment procedure aims to evaluate the potential environmental burdens of the system studied and contains elements of subjective evaluations when different potential environmental impacts such as depletion of resources and climate change are to be compared.

A well-performed LCA will give detailed and specific information and is a useful tool for:

- Identifying locations in the life cycle of the product/system where the potential environmental burdens are high
- Evaluating the consequences of possible changes in the life cycle of the product/system

An LCA can only give information on the product/system studied and is valid only for a limited period of time and only as long as the given parameters remain unchanged.

LCA typically excludes spatial, temporal, threshold and dose-response information, and combines emissions or activities over space and time. Therefore LCA does not characterise the "risk" or "safety" of a technology. That is better performed by (Ecological) Risk Assessment.

LCA is but one tool in the toolbox. In order to contribute to the overall objective of sustainable development any decision making process should also take into account social and economic aspects such as functional value of the packaging eg protection, hygiene, safety, consumer acceptance, costs and convenience.

WHAT TO CHECK BEFORE PARTICIPATING IN A LCA STUDY?

Before participating in a Life Cycle Assessment (LCA) study or sharing data, the following items should be addressed and discussed in an open and transparent procedure by all participants.

One overarching requirement is compliance with the existing ISO standards 14040-14043 for LCA. While perhaps not fully covered by ISO, but somehow linked to the ISO requirements, the most relevant points to highlight are:

TRANSPARENCY

Transparency is one of the most important ISO requirements. This applies to all stages of the life cycle study and especially to all assumptions and value choices involved.

THE SCOPE

The scope of the study must be clearly defined, the limitations of the study should be clearly stated and the names of the parties participating in the study should be stated.

THE OBJECTIVE

The objective of the study must be clearly stated and discussed with and commonly understood by involved stakeholders.

The decisions which should be taken on the basis of the results should be defined

CRITICAL REVIEW

When the LCA study is intended to be used for an environmental claim to be disclosed to the public regarding the superiority or equivalence of one product versus a product which performs the same function ("comparative assertion"), ISO requires a critical review of the study. This is to allow an independent review of the study by external experts.

SYSTEM BOUNDARIES AND FUNCTIONAL UNIT

The system boundaries and the functional unit must be defined and related to the overall service provided.

QUALITY OF DATA

Requirements for the quality of data, level of technology (to be comparable with data from other participants and data sources), validity period of the data and validity period of the study must be defined.

ENERGY MODEL

The energy model must be relevant and discussed with all stakeholders.

When evaluating electrical energy consumption the relevant grid production mix shall be used.

Comment:
Electrical energy is produced from different sources in different countries and consequently has significantly different environmental impact. Although the European electrical grids are linked, the transport capacity between national grids is limited.

ALLOCATION MODELS

Allocation models must be transparent and sensitivity tests are necessary for all major allocation models.

IMPACT CATEGORIES

The chosen impact categories must be defined.

So far, there is only a broad international agreement on impact assessment methods for the categories "climate change" and "ozone depletion". Especially for the impact categories ecotoxicity and human toxicity agreed methods still have to be defined.

Any prioritisation and weighting of impact categories should be very transparent and clearly state and justify the value choices involved. Preferably these steps should be defined at the beginning of the study.

In comparative studies disclosed to the public, weighting (aggregation of results across impact categories to achieve a single score figure) is not ISO compliant.

INTERPRETATION

Here the results of the Life Cycle Inventory (LCI) and – if conducted – the Life Cycle Impact Assessment (LCIA) are qualified, checked and evaluated as a basis for conclusions and decision making. The interpretation should include:

- Identification of significant issues, such as inventory categories (e.g. energy use, emissions, waste), impact categories (e.g. climate change) or essential contributions from processes or life cycle stages (e.g. transport, energy generation)
- Completeness check to verify whether the gained information is sufficient to justify the conclusions
- Consistency check to verify that assumptions, methods and data are consistently applied throughout the study
- Sensitivity check to check the reliability of the final results and conclusions by determining uncertainties in all steps of the study

BEYOND THE ISO STANDARDS WE WOULD LIKE TO DRAW ATTENTION TO THE FOLLOWING IMPORTANT ISSUES:

STAKEHOLDER PARTICIPATION

Industry should be involved from the original goal and scope definition of the study - not just respond to demands for data. The objective is to gain, as a minimum, the ability to constructively comment about the study, its rationale and data/design.

A participant providing data shall have the right to check how the input data is used and processed in the study and have the opportunity to comment on the results. Stakeholders who actively contributed to major parts of the study should be given the opportunity to comment on the study similar to the peer review comments.

DATA CONFIDENTIALITY

Questions relating to the confidentiality of the data provided for the study and the publishing of results shall be defined and agreed upon by the participants.

INTERPRETATION

The interpretation of the results should address the following questions:

- How can comparisons be made between different technologies, especially in light of trade-offs between different potential environmental burdens?
- What differences in potential environmental impacts are to be considered as significant (related to chosen impact categories)?
- How relevant are the significant differences in the context of the overall service provided – proportionality test?
- Under what circumstances could the “losers” overtake the “winners” and how likely is that to happen? For example, can a change in key assumptions (e.g. the number of reuse cycles or transport distances in a comparison between reusable and recyclable packaging) or a change in value choices (e.g. a different weighting of the impact categories) result in a different ranking of the alternatives? This process is essential to examine the validity and stability of the achieved results.

When presenting the results it should be clearly stated that a specific situation at a given time has been studied and that no general conclusions can be drawn from the report.