



SLOVENSKI STANDARD

SIST-TP CEN/TR 13910:2011

01-januar-2011

Nadomešča:
SIST CR 13910:2002

Embalaža - Poročilo o merilih in metodologijah za analizo življenjskega cikla embalaže

Packaging - Report on criteria and methodologies for life cycle analysis of packaging

Verpackung - Bericht über die Kriterien und Methodik von Ökobilanzen für Verpackungen

Emballage - Rapport sur les critères et méthodologies pour l'analyse du cycle de vie des emballages

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Ta slovenski standard je istoveten z: CEN/TR 13910:2010

ICS:

13.020.60	Življenjski ciklusi izdelkov	Product life-cycles
55.020	Pakiranje in distribucija blaga na splošno	Packaging and distribution of goods in general

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TECHNICAL REPORT
RAPPORT TECHNIQUE
TECHNISCHER BERICHT

CEN/TR 13910

August 2010

ICS 13.020.60; 55.020

Supersedes CR 13910:2000

English Version

Packaging - Report on criteria and methodologies for life cycle analysis of packaging

Emballage - Rapport sur les critères et méthodologies pour l'analyse du cycle de vie des emballages

Verpackung - Bericht über die Kriterien und Methodik von Ökobilanzen für Verpackungen

This Technical Report was approved by CEN on 19 June 2010. It has been drawn up by the Technical Committee CEN/TC 261.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

Page

Foreword.....	3
Introduction	4
1 Scope	5
2 Normative references	5
3 Terms and definitions	5
4 Criteria and methodology for life cycle assessment of packaging	7
4.1 General.....	7
4.2 Goal and scope definition	8
4.2.1 General.....	8
4.2.2 Function, functional unit and reference flow	10
4.2.3 Allocation.....	11
4.2.4 Data Quality	14
4.2.5 Boundary between packaging and the products	14
4.3 Life cycle inventory analysis	16
4.4 Life cycle impact assessment	16
4.4.1 General.....	16
4.4.2 Single impact category indicators	16
4.5 Life cycle interpretation	17
4.5.1 General.....	17
4.5.2 Key data points, setting and assumptions	18
4.5.3 Limitations, uncertainties and significance of results	19
5 Presentation and communication	20
6 Critical review.....	20
7 Further requirements and aspects to consider	20
7.1 General limitations of LCA as a tool/method	20
7.2 Limitations in the context of specific areas of application of packaging LCAs	20
7.2.1 General.....	20
7.2.2 Comparative packaging LCAs	21
7.2.3 Packaging function and logistics.....	21
Annex A (informative) Cross-references.....	22
Bibliography	23

Foreword

This document (CEN/TR 13910:2010) has been prepared by Technical Committee CEN/TC 261 "Packaging", the secretariat of which is held by AFNOR.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes CR 13910:2000.

This Technical Report defines and describes how to apply Life Cycle Assessment (LCA) to packaging and distribution systems. The expression "Life Cycle Analysis", applied in the EU Packaging Directive, is in this report considered as identical to the concept of "Life Cycle Assessment" in the EN ISO 14040 standards.

This Technical Report has been prepared by the CEN Working Group, CEN/TC 261/SC 4/WG 1/TG 1, which has been considering the aspects of life cycle assessment specific to packaging, in order to fulfil the "Mandate 200 rev.3 to CEN for Standardisation and a study related to packaging and packaging waste", requested by the EU Commission.

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CEN/TR 13910:2010 (E)**Introduction**

Packaging is an integral part of modern society providing means for protection, presentation, information and distribution of products to industry, trade and consumers.

In 1994 the European Parliament and the European Council adopted a Directive on Packaging and Packaging Waste, covering all types of packaging placed on the market in the European Community and all packaging waste, whether used or released at the industrial, commercial, office, shop, service, household level or at any other level, regardless of the material used.

The Directive aims to harmonise national measures concerning the management of packaging and packaging waste in order to, on the one hand, prevent any impact thereof on the environment of all Member States, as well as of third countries, or to reduce such impact, thus providing a high level of environmental protection, and, on the other hand, to ensure the functioning of the internal market and to avoid obstacles to trade, and the distortion and restriction of competition within the European Community. The two objectives are on an equal footing.

Article 10 of the Directive states that the European Commission shall promote the preparation of European standards relating to the essential requirements referred to in Annex II of the Directive and, in particular, the preparation of European Standards relating to, among others:

— criteria and methodologies for life-cycle analysis of packaging.

The present Technical Report covers the work of CEN to meet that requirement.

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1 Scope

This Technical Report establishes a set of best practice guidelines for undertaking those aspects of life cycle assessment specific to packaging and distribution systems.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN ISO 14040:2006, *Environmental management — Life cycle assessment — Principles and framework (ISO 14040:2006)*

EN ISO 14044:2006, *Environmental management — Life cycle assessment — Requirements and guidelines (ISO 14044:2006)*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

This section defines the LCA and packaging specific terms used in this report. The LCA terms are based on definitions given in EN ISO 14040:2006, and the packaging terms are based on definitions in the European Parliament and the Council Directive on Packaging and Packaging Waste (94/62/EC) and terms and definitions referred to in EN 13193 unless stated otherwise.

3.1

life cycle assessment

LCA

compilation and evaluation of the inputs, outputs and the potential environmental impacts of a product system throughout its life cycle

3.2

life cycle inventory analysis

LCI

phase of life cycle assessment involving the compilation and quantification of inputs and outputs, for a product throughout its life cycle

3.3

life cycle impact assessment

LCIA

phase of life cycle assessment aimed at understanding and evaluating the magnitude and significance of the potential environmental impacts for a product system throughout the life cycle of the product

3.4

life cycle interpretation

phase of life cycle assessment in which the findings of either the inventory analysis or the impact assessment, or both, are evaluated in relation to the defined goal and scope in order to reach conclusions and recommendations

3.5

packaging

all items made of any material of any nature to be used for the containment, protection, handling, delivery and presentation of goods, from raw materials to processed goods, from the producer to the user or the consumer

CEN/TR 13910:2010 (E)

NOTE In this report the goods are referred to as "packaged product" or just "product", in order to distinguish it from the packaging.

3.6**sales packaging****primary packaging**

packaging conceived so as to constitute a sales unit to the final user or consumer at the point of purchase

3.7**grouped packaging****secondary packaging**

packaging conceived so as to constitute at the point of purchase a grouping of a certain number of sales units whether the latter is sold as such to the final user or consumer or whether it serves only as a means to replenish the shelves at the point of sale

NOTE It can be removed from the product without affecting its characteristics.

3.8**transport packaging****tertiary packaging**

packaging conceived so as to facilitate handling and transport of a number of sales units or grouped packaging in order to prevent physical handling and transport damage

NOTE Transport packaging does not include road, rail, ship and air containers.

3.9**used packaging**

packaging or packaging material remaining after the removal of the product it contained

3.10**distribution system**

necessary physical arrangements (packing, storage, transport and merchandising) to bring a product from its manufacturing stage, to its final stage of consumption/use

3.11**collection system**

necessary physical arrangements (sorting, collecting, transport and storage) to bring used packaging from the point of consumption to the point of reuse, recovery or final disposal

3.12**functional unit of packaging**

quantified performance of a product system of packaging, for use as a reference unit in an LCA study

3.13**carbon footprint**

overall amount, expressed in terms of CO₂ equivalents, of carbon dioxide (CO₂) and other greenhouse gas (GHG) emissions associated with a product, using LCA methodology

NOTE Carbon footprint essentially coincides with the impact category that has generally been referred to under the name "global warming potential" (GWP) in most LCAs to date. Both terms are meant as a measure of the potential contribution to the global phenomenon of climate change, which may also include regional side-effects such as storms and local cooling.

3.14**critical review**

process intended to ensure consistency between a life cycle assessment and the principles and requirements of the standards on life cycle assessment

3.15**interested party**

individual or group concerned with or affected by the environmental performance of a product system, or by the results of the life cycle assessment

3.16**allocation**

partitioning the input or output flows of a process or a product system between the product system under study and one or more other product systems

4 Criteria and methodology for life cycle assessment of packaging**4.1 General**

According to EN ISO 14040, an LCA shall include the following phases: definition of goal and scope, inventory analysis, impact assessment and interpretation of results, as illustrated in Figure 1, below.

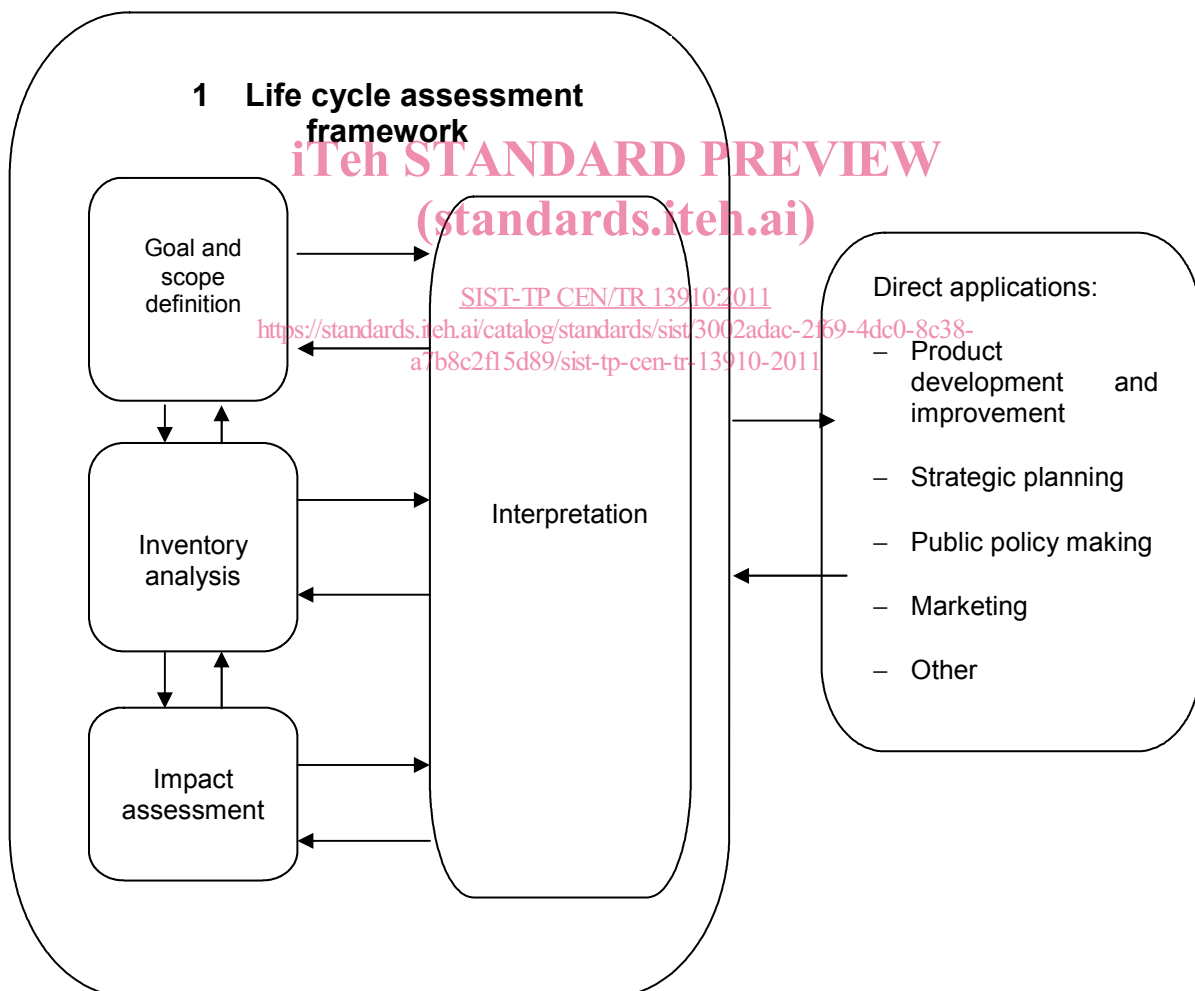


Figure 1 — Phases of an LCA

CEN/TR 13910:2010 (E)**Applications**

LCA can assist in:

- identifying opportunities to improve the environmental performance of products at various points in their life cycle;
- informing decision-makers in industry, government or non-government organizations (e.g. for the purpose of strategic planning, priority setting, product or process design or redesign);
- the selection of relevant indicators of environmental performance, including measurement techniques;

and

- marketing (e.g. implementing an ecolabelling scheme, making an environmental claim, or producing an environmental product declaration).

It is recommended to address those or other intended applications of a dedicated packaging LCA study in the goal and scope section.

4.2 Goal and scope definition**4.2.1 General**

The goal and scope of an LCA study of packaging shall be clearly defined, documented and consistent with the intended application. As illustrated in Figure 1 above, the goal and scope definition should be used as a reference all through the study, and in the reporting of the results.

In defining the goal of such an LCA, the following items shall be unambiguously stated: the intended application, the reasons for carrying out the study, the intended audience and whether the results are intended to be used in comparative assertions intended to be disclosed to the public. In addition, the following comments on how packaging is actually used have to be taken into account.

Packaging is always used to pack products, resulting in a strong link between the packaging and the packaged product. Packaging is used to facilitate handling and transportation through the logistic chain, to protect the product, prevent product losses and give relevant information. This means that all packaging items, for example closures, labels, communicative devices (e.g. RFID) and printing inks have to be taken into account.

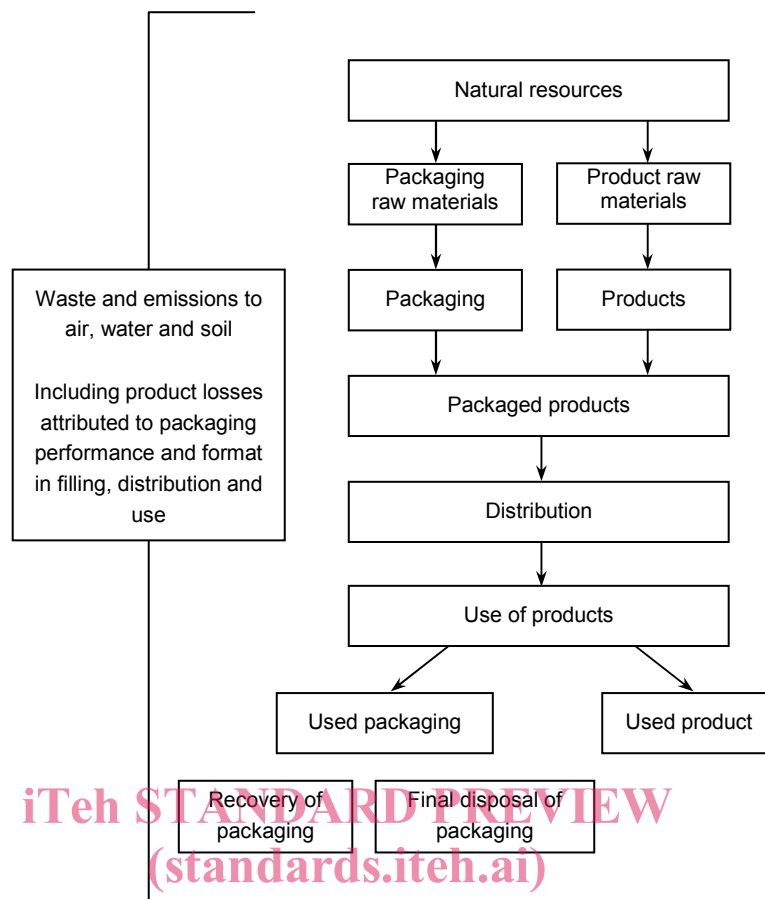
Packaging is one component of a distribution system. A change of packaging will therefore often cause changes in this system, resulting in changes in resource consumption, emissions and hence in the environmental impact of the total system. Following the cradle-to-grave definition in EN ISO 14040:2006, LCA studies of packaging should therefore include the distribution system, the wastage of packaging material and products, the relevant collection systems, as well as recovery and/or disposal operations.

Primary, secondary and tertiary packaging have a direct influence upon each other's function, construction and dimensions. They are all integral parts of the distribution system and should be included in the LCA.

In some cases, the production or use of products may be influenced by a change of packaging, which should also be considered in an LCA study.

To assess impact categories for packaging in isolation from the packaged product and the distribution system should therefore be avoided as the packaging system is designed to fulfil its functions in relation to the contained product and the physical distribution system.

Most packaging only follows the packaged product through a certain part of its life cycle, hence an LCA of the packaging system should include all the steps of the life cycle of the packaging. The life cycle of a packaging system is illustrated in Figure 2, below.



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Figure 2 — Illustration of the life cycle of a packaging system

EXAMPLE 1 Transportation system should be considered in the LCA boundaries.

The consideration here could apply to different packaging configurations within one packaging system or across different packaging systems.

An example for the first case is when Yoghurt pots packed in strong boxes can be loaded to greater heights in a large vehicle. Weaker boxes cannot be put on top of each other to the same extent. Hence, more transportation capacity is needed and therefore more fuel is used per ton of products transported. An example for the second case is when the alternative is to distribute yoghurt in glass containers or plastic containers. Again, more transportation capacity might be needed if a glass container is used and therefore more fuel is used per ton of products transported.

Results for the overall packaging system will change with the distribution distance applied in a dedicated LCA study. Thus, the settings of the transportation system model should also include a rationale for and documentation of the selected distribution logistics and distances.

Furthermore, when packaging components from different raw materials are compared against each other, disadvantages in the transportation step might be balanced by advantages in the recovery efficiency of the different materials. Assessment of the transportation system should not be done without consideration of the overall packaging system including end-of-life fate.

EXAMPLE 2 Primary and secondary packaging should be considered.

An LCA of yoghurt includes the comparison of primary packs from different packaging raw materials for the same yoghurt product. In this case it is important to define the adequate weight and raw material composition of the primary packs. For both packs this packaging definition should reflect comparable technical standards. Moreover, the compared types of primary pack might also be associated with different settings of secondary (and tertiary) packaging. For instance if in one