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Environmental management — Life cycle assessment — Life cycle interpretation

Management environnemental — Analyse du cycle de vie — Interprétation du cycle de vie

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 14043 was prepared by Technical Committee ISO/TC 207, *Environmental management*, Subcommittee SC 5, *Life cycle analysis*.

Annex A of this International Standard is for information only.

Introduction

This International Standard on life cycle interpretation describes the final phase of the life cycle assessment (LCA) procedure, in which the results of a life cycle inventory analysis (LCI) and — if conducted — of a life cycle impact assessment (LCIA), or both, are summarized and discussed as a basis for conclusions, recommendations and decision-making in accordance with the goal and scope definition.

An LCA study begins with the goal and scope definition phase and finishes with the interpretation phase.

Life cycle interpretation is a systematic procedure to identify, qualify, check and evaluate information from the results of the LCI and/or LCIA of a product system, and to present them in order to meet the requirements of the application as described in the goal and scope of the study. The practitioner undertaking the LCA study should be in close contact with the commissioner throughout the study in order to ensure that specific questions are addressed. This communication also has to be maintained through the life cycle interpretation phase. Therefore, transparency throughout the life cycle interpretation phase is essential. Where preferences, assumptions or value-choices are involved, these need to be clearly stated by the LCA practitioner in the final report.

LCA is but one of several tools to help in decision-making, irrespective of the application, for example for information purposes (documentation of existing product systems), for improvements (implementation of changes to existing product systems) or for establishment of a new product system.

Life cycle interpretation may also demonstrate links which exist between LCA and other environmental management techniques, by rationalizing and focusing on the results. It is therefore important not only to look backward from application to the life cycle interpretation phase (and the other phases) of the LCA but also forward, e.g. to the concurrent use of other techniques.

Life cycle interpretation includes communication, to give credibility to the results of other LCA phases (namely the LCI and LCIA), in a form that is both comprehensible and useful to the decision-maker.

Whereas decisions based on technical performance, economic or social aspects are outside the LCA study, environmental issues chosen for inclusion as part of the goal and scope definition may reflect such issues.

Environmental management — Life cycle assessment — Life cycle interpretation

1 Scope

This International Standard provides requirements and recommendations for conducting the life cycle interpretation in LCA or LCI studies.

This International Standard does not describe specific methodologies for the life cycle interpretation phase of LCA and LCI studies.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 14040:1997, *Environmental management — Life cycle assessment — Principles and framework.*

ISO 14041:1998, *Environmental management — Life cycle assessment — Goal and scope definition and inventory analysis.*

ISO 14042:2000, *Environmental management — Life cycle assessment — Life cycle impact assessment.*

ISO 14050:1998, *Environmental management — Vocabulary*.

3 Terms and abbreviated terms

3.1 Terms and definitions

For the purposes of this International Standard, the terms and definitions given in ISO 14040, ISO 14041, ISO 14042 and ISO 14050 and the following apply.

3.1.1
completeness check
process of verifying whether information from the preceding phases of an LCA or an LCI study is sufficient for reaching conclusions in accordance with the goal and scope definition

3.1.2
consistency check
process of verifying that the assumptions, methods and data are consistently applied throughout the study and in accordance with the goal and scope definition

NOTE The consistency check should be performed before conclusions are reached.

3.1.3
evaluation
⟨life cycle interpretation⟩ second step within the life cycle interpretation phase to establish confidence in the results of the LCA or LCI study

NOTE Evaluation includes the completeness check, sensitivity check, consistency check, and any other validation that may be required in accordance with the goal and scope definition of the study.

3.1.4
sensitivity check
process of verifying that the information obtained from a sensitivity analysis is relevant for reaching the conclusions and giving recommendations

3.2 Abbreviated terms

LCA life cycle assessment

LCI life cycle inventory analysis

LCIA life cycle impact assessment

4 General description of life cycle interpretation

4.1 Objectives of life cycle interpretation

The objectives of life cycle interpretation are to analyse results, reach conclusions, explain limitations and provide recommendations based on the findings of the preceding phases of the LCA or LCI study and to report the results of the life cycle interpretation in a transparent manner.

Life cycle interpretation is also intended to provide a readily understandable, complete and consistent presentation of the results of an LCA or an LCI study, in accordance with the goal and scope definition of the study.

4.2 Key features of life cycle interpretation

The key features of life cycle interpretation are:

— the use of a systematic procedure to identify, qualify, check, evaluate and present the conclusions based on the findings of an LCA or LCI study, in order to meet the requirements of the application as described in the goal and scope of the study;

— the use of an iterative procedure both within the interpretation phase and with the other phases of an LCA or an LCI study;

— the provision of links between LCA and other techniques for environmental management by emphasizing the strengths and limits of an LCA or an LCI study in relation to its goal and scope definition.

4.3 Elements of life cycle interpretation

The life cycle interpretation phase of an LCA or an LCI study comprises three elements as depicted in Figure 1, as follows:

— identification of the significant issues based on the results of the LCI and LCIA phases of LCA;

— evaluation which considers completeness, sensitivity and consistency checks;

— conclusions, recommendations and reporting.

4.4 Relationship

The relationship of the interpretation phase to other phases of LCA is shown in Figure 1.

The goal and scope definition and interpretation phases of life cycle assessment frame the study, whereas the other phases of LCA (LCI and LCIA) produce information on the product system.

5 Identification of significant issues

5.1 Objective

NOTE See clause A.2 in annex A for examples.

The objective of this element is to structure the results from the LCI or LCIA phases in order to determine the significant issues, in accordance with the goal and scope definition and interactively with the evaluation element. The purpose of this interaction is to include the implications of the methods used, assumptions made, etc. in the preceding phases, such as allocation rules, cut-off decisions, selection of impact categories, category indicators and models, etc.

5.2 Identification and structuring of information

There are four types of information required from the findings of the preceding phases of the LCA or the LCI study:

a) the findings from the preceding phases (LCI and LCIA), which shall be assembled and structured together with information on data quality. These results should be structured in an appropriate manner, e.g. in accordance with the stages in the life cycle, the different processes or unit operations in the product system, transportation, energy supply and waste management. This may be in the form of data lists, tables, bar diagrams or other appropriate representation of the inputs and outputs and/or category indicators results. Therefore, all relevant results available at the time will be gathered and consolidated for further analysis;

b) methodological choices, such as allocation rules and product system boundaries from the LCI and category indicators and models used in LCIA;

c) the value-choices used in the study as found in the goal and scope definition;

d) the role and responsibilities of the different interested parties as found in the goal and scope definition in relation to the application, and also the results from a concurrent critical review process, if conducted.

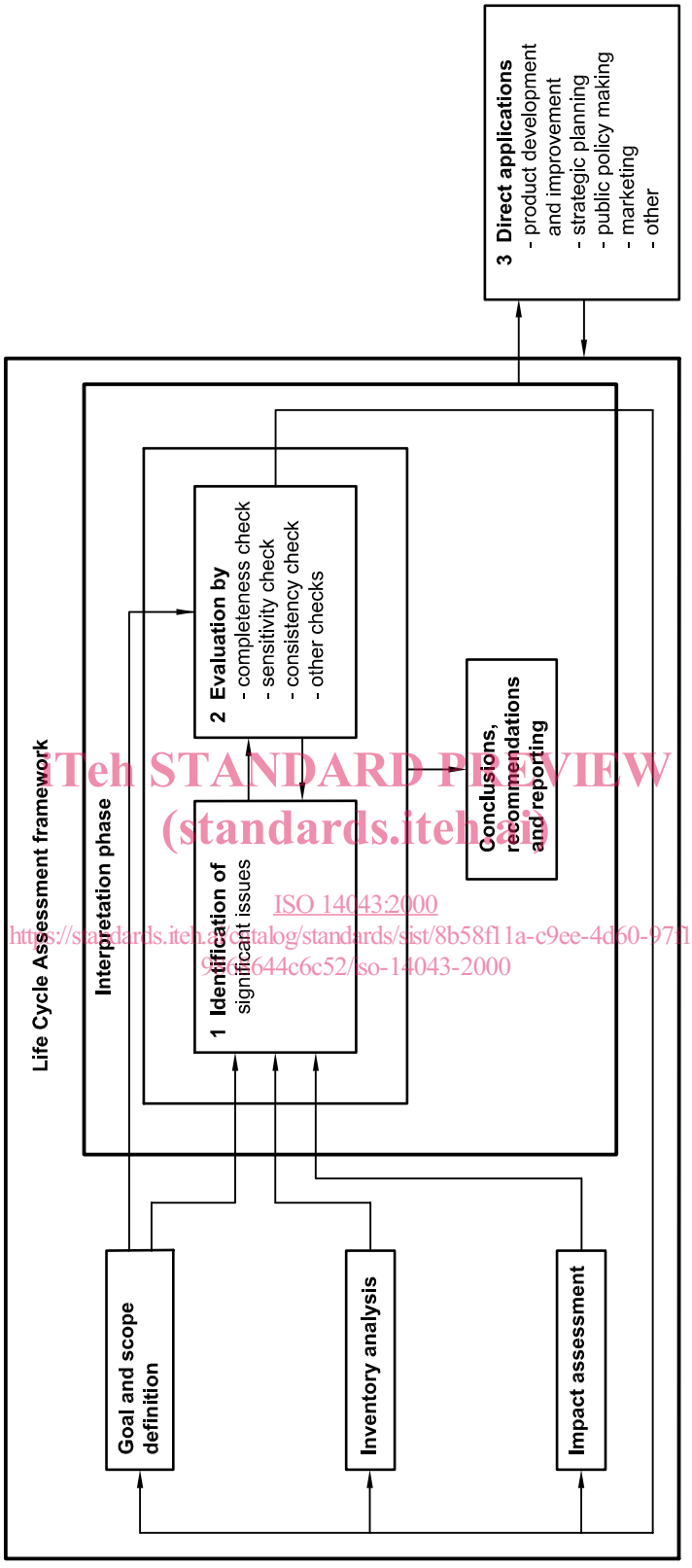

Figure 1 — Relationships of the elements within the interpretation phase with the other phases of LCA

5.3 Determining the significant issues

When the results from the preceding phases (LCI, LCIA) have been found to meet the demands of the goal and scope of the study, the significance of these results shall then be determined. The results from both the LCI phase and/or LCIA phase are used for this purpose. This should be done as an iterative process with the evaluation element.

Significant issues can be:

— inventory data categories, such as energy , emissions, waste, etc.;

— impact categories, such as resource use, Global Warming Potential, etc.;

— essential contributions from life cycle stages to LCI or LCIA results, such as individual unit processes or groups of processes like transportation and energy production.

Determining significant issues of a product system can be simple or complex. This International Standard does not provide guidance on why an issue may or may not be relevant in a study, or why an issue may or may not be significant for a product system.

A variety of specific approaches, methods and tools are available to identify environmental issues and to determine their significance.

6 Evaluation

6.1 Objectives and requirements

NOTE See clause A.3 in annex A for examples.

The objectives of the evaluation element are to establish and enhance the confidence in and the reliability of the results of the LCA or the LCI study, including the significant issues identified in the first element of the interpretation. The results should be presented in a manner which gives the commissioner or any other interested party a clear and understandable view of the outcome of the study.

The evaluation shall be undertaken in accordance with the goal and scope of the study, and should take into account the final intended use of the study results.

During the evaluation, the use of the following three techniques shall be considered:

a) completeness check (see 6.2);

b) sensitivity check (see 6.3);

c) consistency check (see 6.4).

The results of uncertainty analysis and assessment of data quality should supplement these checks.

6.2 Completeness check

6.2.1 Objective

The objective of the completeness check is to ensure that all relevant information and data needed for the interpretation are available and complete.