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**Environmental management — Life cycle  
assessment — Principles and framework**

*Management environnemental — Analyse du cycle de vie —  
Principes et cadre*



## Foreword

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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.

International Standard ISO 14040 was prepared by Technical Committee ISO/TC 207, *Environmental management*, Subcommittee SC 5, *Life cycle assessment*.

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## Introduction

The heightened awareness of the importance of environmental protection, and the possible impacts associated with products<sup>1)</sup> manufactured and consumed, has increased the interest in the development of methods to better comprehend and reduce these impacts. One of the techniques being developed for this purpose is Life Cycle Assessment (LCA). This International Standard describes the principles and framework for conducting and reporting LCA studies, and includes certain minimal requirements.

LCA is a technique for assessing the environmental aspects and potential impacts associated with a product, by

- compiling an inventory <sup>2)</sup> of relevant inputs and outputs of a product system ;
- evaluating the potential environmental impacts associated with those inputs and outputs ;
- interpreting the results of the inventory analysis and impact assessment phases in relation to the objectives of the study.

LCA studies the environmental aspects and potential impacts throughout a product's life (i.e. cradle-to-grave) from raw material acquisition through production, use and disposal. The general categories of environmental impacts needing consideration include resource use, human health, and ecological consequences.

LCA can assist in

- identifying opportunities to improve the environmental aspects of products at various points in their life cycle ;
- decision-making in industry, governmental or non-governmental organizations (e.g. strategic planning, priority setting, product or process design or redesign) ;
- selection of relevant indicators of environmental performance, including measurement techniques ; and
- marketing (e.g. an environmental claim, ecolabelling scheme or environmental product declaration).

This International Standard recognizes that LCA is still at an early stage of development. Some phases of the LCA technique, such as impact assessment, are still in relative infancy. Considerable work remains to be done and practical experience gained in order to further develop the level of LCA practice. Therefore, it is important that the results of LCA be interpreted and applied appropriately.

If LCA is to be successful in supporting environmental understanding of products, it is essential that LCA maintains its technical credibility while providing flexibility, practicality and cost effectiveness of application. This is particularly true if LCA is to be applied within small- and medium-sized enterprises.

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<sup>1)</sup> In this International Standard, the term "product" used alone not only includes product systems but can also include service systems.

<sup>2)</sup> An inventory may include environmental aspects which are not directly related to the inputs and outputs of the system.

The scope, boundaries and level of detail of an LCA study depend on the subject and intended use of the study. The depth and breadth of LCA studies may differ considerably depending on the goal of a particular LCA study. However, in all cases, the principles and framework established in this International Standard should be followed.

LCA is one of several environmental management techniques (e.g. risk assessment, environmental performance evaluation, environmental auditing, and environmental impact assessment) and may not be the most appropriate technique to use in all situations. LCA typically does not address the economic or social aspects of a product.

Because all techniques have limitations, it is important to understand those that are present in LCA. The limitations include the following.

- The nature of choices and assumptions made in LCA (e.g. system boundary setting, selection of data sources and impact categories) may be subjective.
- Models used for inventory analysis or to assess environmental impacts are limited by their assumptions, and may not be available for all potential impacts or applications.
- Results of LCA studies focused on global and regional issues may not be appropriate for local applications, i.e. local conditions might not be adequately represented by regional or global conditions.
- The accuracy of LCA studies may be limited by accessibility or availability of relevant data, or by data quality, e.g. gaps, types of data, aggregation, average, site-specific.
- The lack of spatial and temporal dimensions in the inventory data used for impact assessment introduces uncertainty in impact results. This uncertainty varies with the spatial and temporal characteristics of each impact category.

Generally, the information developed in an LCA study should be used as part of a much more comprehensive decision process or used to understand the broad or general trade-offs. Comparing results of different LCA studies is only possible if the assumptions and context of each study are the same. These assumptions should also be explicitly stated for reasons of transparency.

This International Standard provides principles and framework and provides some methodological requirements for conducting LCA studies. Additional details regarding methods are provided in the complementary International Standards ISO 14041, ISO 14042 and ISO 14043 concerning the various phases of LCA .

This International Standard, like other International Standards, is not intended to be used to create non-tariff trade barriers or to increase or change an organization's legal obligations.

# Environmental management — Life cycle assessment — Principles and framework

## 1 Scope

This International Standard specifies the general framework, principles and requirements for conducting and reporting life cycle assessment studies. This International Standard does not describe the life cycle assessment technique in detail.

## 2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this International Standard. At the time of the publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 14041: —<sup>3</sup>      *Environmental management - Life cycle assessment - Goal and scope definition and life cycle inventory analysis*

## 3 Definitions

For the purposes of this International Standard, the following definitions apply.

### 3.1

#### **allocation**

partitioning the input or output flows of a unit process to the product system under study

### 3.2

#### **comparative assertion**

environmental claim regarding the superiority or equivalence of one product versus a competing product which performs the same function

### 3.3

#### **elementary flow**

(1) material or energy entering the system being studied, which has been drawn from the environment without previous human transformation

(2) material or energy leaving the system being studied, which is discarded into the environment without subsequent human transformation

### 3.4

#### **environmental aspect**

element of an organization's activities, products or services that can interact with the environment

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<sup>3</sup> To be published.