PD ISO/TS 14074:2022



BSI Standards Publication

Environmental management — Life cycle assessment — Principles, requirements and guidelines for normalization, weighting and interpretation

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National foreword

This Published Document is the UK implementation of ISO/TS 14074:2022.

The UK participation in its preparation was entrusted to Technical Committee SES/1/5, Environmental Management - Life cycle tools and techniques.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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© The British Standards Institution 2023
Published by BSI Standards Limited 2023

ISBN 978 0 539 14518 2

ICS 13.020.10; 13.020.60

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This Published Document was published under the authority of the Standards Policy and Strategy Committee on 31 May 2023.

Amendments/corrigenda issued since publication

Date	Text affected

PD ISO/TS 14074:2022

TECHNICAL SPECIFICATION

ISO/TS 14074

First edition
2022-11-11

Environmental management — Life cycle assessment — Principles, requirements and guidelines for normalization, weighting and interpretation

Management Environnemental — Analyse du cycle de vie — Principes, exigences et lignes directrices pour la normalisation, la pondération et l'interprétation

Reference number
ISO/TS 14074:2022(E)

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

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

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

The United Nations Sustainable Development Goals (SDGs)[3] identify the need for transition toward sustainable patterns of consumption and production. Life cycle assessment (LCA) can support this goal with a quantitative approach to evaluating the environmental impacts of products from raw material acquisition to end-of-life treatment (disposal, recycling, etc). It can help with the identification of improvement potentials of measures to achieving SDGs and can compare alternative approaches on product, company and country levels.

NOTE The term "environmental impact" is always used in the sense of potential environmental impact.

LCA studies can help to identify ways of improving resource and energy efficiency, avoiding releases to the environment, and developing a circular economy. LCA can also help identify and evaluate trade-offs between different environmental aspects and life cycle stages.

ISO 14040 and ISO 14044 are the generic environmental management standards for LCA. These standards provide principles, requirements and guidelines for the four phases of an LCA: goal and scope definition, life cycle inventory analysis, impact assessment and interpretation.

Normalization and weighting are optional elements of life cycle impact assessment (LCIA). These elements can support the interpretation of the assessed life cycle impact category indicator results, also known as the "LCIA profile".

Presently, LCA results are interpreted through a variety of different methods and approaches. A consistent approach to the interpretation of LCA results can be helpful, especially considering the growth in LCA applications, such as:

— LCA-based regulations, e.g. greenhouse gas reporting;

— national programmes for LCA-based environmental statements, e.g. environmental labelling;

— use of LCA to support public and private sector procurement, e.g. environmental product declarations (EPDs), footprint communication.

Through providing additional principles, requirements and guidelines applicable to normalization, weighting and interpretation of LCA results, this document:

— improves the credibility of LCA results;

— increases the use of LCA results in decision-making related to environmental management;

— increases the number of LCA studies and applications;

— improves the interpretation phase of LCA.

In this way, this document aims to increase the contribution of LCA to advancing sustainable consumption and production patterns.

In this document, the following verbal forms are used:

— "shall" indicates a requirement;

— "should" indicates a recommendation;

— "may" indicates a permission;

— "can" indicates a possibility or a capability.

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Environmental management — Life cycle assessment — Principles, requirements and guidelines for normalization, weighting and interpretation

1 Scope

This document specifies principles, requirements and guidelines for normalization, weighting and life cycle interpretation, in addition to those given in ISO 14040 and ISO 14044.

The document is applicable to any life cycle assessment (LCA) and footprint quantification study.

In particular, this document addresses:

— the use of normalization and its limitations;

— the use of weighting and its limitations;

— the selection or development of weighting factors;

— the generation of single scores;

— requirements that relate to documentation and reporting.

For the interpretation phase, it provides, in addition to ISO 14044, procedures and guidance for:

— performing completeness, sensitivity and consistency checks;

— addressing uncertainties and limitations;

— documenting conclusions and recommendations.

This document does not specify the composition of panels for weighting nor does it specify multi-criteria decision analysis.

This document does not intend to recommend or require a specific weighting approach or method or any priority of one weighting approach or method over another as they are based on value choices. Organizations have the flexibility to implement LCA in accordance with the intended application and the requirements of the organization.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

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

ISO 14044, *Environmental management — Life cycle assessment — Requirements and guidelines*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 14044 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

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