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# Environmental management — Life cycle assessment — Requirements and guidance for organizational life cycle assessment

*Management environnemental — Analyse du cycle de vie — Exigences et recommandations relatives à l'analyse du cycle de vie organisationnelle*



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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 document 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).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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*.

This first edition cancels and replaces ISO/TS 14072:2014, which has been technically revised.

The main changes are as follows:

— additional specifications on the organizational life cycle assessment (LCA);

— corrections of inconsistencies.

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.

# Introduction

In order to analyse the environmental performance of products, it has become standard to use a life cycle perspective to capture all impacts from resource extraction to the disposal of the product. The benefits and the potential of the life cycle approach are not limited to an application on products. While the life cycle assessment (LCA) methodology was originally developed for products, its application at the organizational level is becoming more and more relevant. However, an organizational LCA (OLCA) appears to be even more complex. There is more than one product life cycle to follow, as most organizations are engaged in many product life cycles to different degrees and a large part of environmental impact can reside outside the organization's gate, upstream and downstream of the value chain.

This document applies to LCA for organizations. It, therefore, extends the application of ISO 14040 and ISO 14044 to all the activities of the organization, meaning that the reporting unit of the system allows coverage of different products and unit processes of any organization within the same LCA study.

The choice of goal and scope by the organization during its LCA study is key to assisting this organization in making the relevant choices according to this document, including the products and unit processes that are studied, the related system boundary, and the time frame which is covered.

# Environmental management — Life cycle assessment — Requirements and guidance for organizational life cycle assessment

## 1 Scope

This document specifies additional requirements and gives guidance for an effective application of ISO 14040:2006 and ISO 14044:2006 to organizations.

This document provides:

— the application of life cycle assessment (LCA) principles and methodology to organizations;

— the benefits that LCA can bring to organizations by using LCA methodology at an organizational level;

— the system boundary;

— specific considerations when dealing with life cycle inventory (LCI), life cycle impact assessment (LCIA) and interpretation;

— the limitations regarding reporting, environmental declarations and comparative assertions.

This document is applicable to any organization that has interest in applying LCA. It is not intended for the interpretation of ISO 14001 and specifically covers the goals of ISO 14040 and ISO 14044.

This document is applicable to an organization for a given time period.

This document is applicable to all types of organizations. If properly justified, application of this document to segments or selected companies of an organization is possible.



## 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 14040:2006, *Environmental management — Life cycle assessment — Principles and framework*

ISO 14044:2006, *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 14040 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

— IEC Electropedia: available at https://www.electropedia.org/

**3.1**
**organization**
person or group of people that has its own functions with responsibilities, authorities and relationships to achieve its objectives

Note 1 to entry: The concept of organization includes, but is not limited to sole-trader, company, corporation, firm, enterprise, authority, partnership, charity or institution, or part or combination thereof, whether incorporated or not, public or private.

[SOURCE: ISO 14001:2015, 3.1.4]

**3.2**
**reporting unit**
quantified performance expression of the *organization* (3.1) under study used as a reference

Note 1 to entry: In the case of an *organizational life cycle assessment* (3.7), the reporting unit replaces the functional unit.

**3.3**
**unit process**
smallest element considered in the life cycle inventory analysis for which input and output data are quantified

[SOURCE: ISO 14044:2006, 3.34]

**3.4**
**performance tracking of an organization**
comparison of the performance of the same *organization's* (3.1) products and *unit processes* (3.3) over time, based on the same time period, system boundary, and *reporting unit* (3.2)

**3.5**
**environmental performance**
performance related to the management of environmental aspects

[SOURCE: ISO 14001:2015, 3.4.11, modified — Note 1 to entry deleted.]

**3.6**
**facility**
single installation, set of installations or production processes (stationary or mobile), which can be defined within a single geographical boundary, organizational unit or production process

[SOURCE: ISO 14064-1:2018, 3.4.1]

**3.7**
**organizational life cycle assessment**
**OLCA**
compilation and evaluation of the inputs, outputs and potential environmental impacts of the activities associated with an *organization* (3.1) as a whole, or portion thereof, adopting a life cycle perspective

Note 1 to entry: The results of an OLCA are sometimes referred to as an organization's environmental footprint.

**3.8**
**consolidation methodology**
approach selected by the *organization* (3.1) in setting organizational boundaries, for assessing the inputs, outputs and potential environmental impacts of the activities associated with the organization

Note 1 to entry: Three distinct approaches are used: the *operational control* (3.9), *financial control* (3.10) or *equity share* (3.11).

**3.9**
**operational control**
full authority to introduce and implement operating policies at the operation level

Note 1 to entry: Financial or insurance companies can apply this document by dealing with their funding activity as if it was an operational control. ISO/TR 14069:2013, Annex E, provides an example of guidance in the case of greenhouse gases.

**3.10**
**financial control**
ability to direct the financial and operating policies of the *organization* (3.1) with a view to gain economic benefits from its activities

**3.11**
**equity share**
extent of the rights an *organization* (3.1) has to the risks and rewards from an operation based on its equity interest

Note 1 to entry: Equity share is, therefore, the same as the ownership percentage.

## 4 General

The principles of ISO 14040 also apply for the OLCA. They can be adapted to the organizational context.

NOTE In the case of an OLCA, the reporting unit replaces the functional unit.

This document provides an explicit adaptation of the requirements of ISO 14040 and ISO 14044 to an organizational context, where applicable (see Table A.2). An OLCA shall follow the requirements of Annex A.

This document shall not be used for LCA studies intended to be used for comparative assertions between different organizations intended to be disclosed to the public (e.g. ranking among organizations).

This document explains how to calculate the potential environmental impacts of the organization based on ISO 14040 and ISO 14044. The environmental aspects of an organization are generally addressed in ISO 14001. This document can support the identification and quantification of relevant environmental aspects including those beyond the organizational boundaries.

## 5 Organizational life cycle assessment

### 5.1 General

This document provides requirements and guidance for the type of information to be used by organizations for assessing potential environmental impacts considering the life cycle perspective (see ISO 14040:2006, 4.1.2.), including their upstream and downstream supply chain.

The benefits that LCA can bring to organizations are the following:

— capability to identify, evaluate and interpret the significance of the environmental aspects related to the management system as defined in ISO 14001;

— a strategic tool for comprehensive environmental assessment, which can lead to management decisions;

— a tool for decision-making, to prioritize the actions that aim to reduce potential environmental impacts while considering products and unit processes;

— assist the performance tracking of an organization, and trace any “multi-criteria” environmental improvements (see Annex C);

— report any potential environmental impacts over a given period of time;

— identify burden shifting (e.g. through outsourcing, upstream and downstream, or between impacts);

— improve transparency, knowledge, control and management of the supply chain.

Performance tracking of an organization between two periods of time can lead to the reporting of improvements.

Performance tracking is based on the same reporting unit. A given tolerance may be considered to state that two reporting units are “the same”. This tolerance should be determined by the practitioner according to the goal and scope of the LCA study. This tolerance shall be quantified and transparently reported in the LCA report.

## 5.2 Goal and scope definition

### 5.2.1 General

This subclause provides requirements and guidance on how to:

— model upstream and downstream supply chains and processes, and how to collect the appropriate data;

— determine the reporting unit for an organization in replacement of the functional unit which is used for product systems (see Table A.2);

— define the goal of an OLCA.

In defining the goal of the OLCA, the following items shall be unambiguously stated (see Table A.2):

— the intended application (e.g. performance tracking);

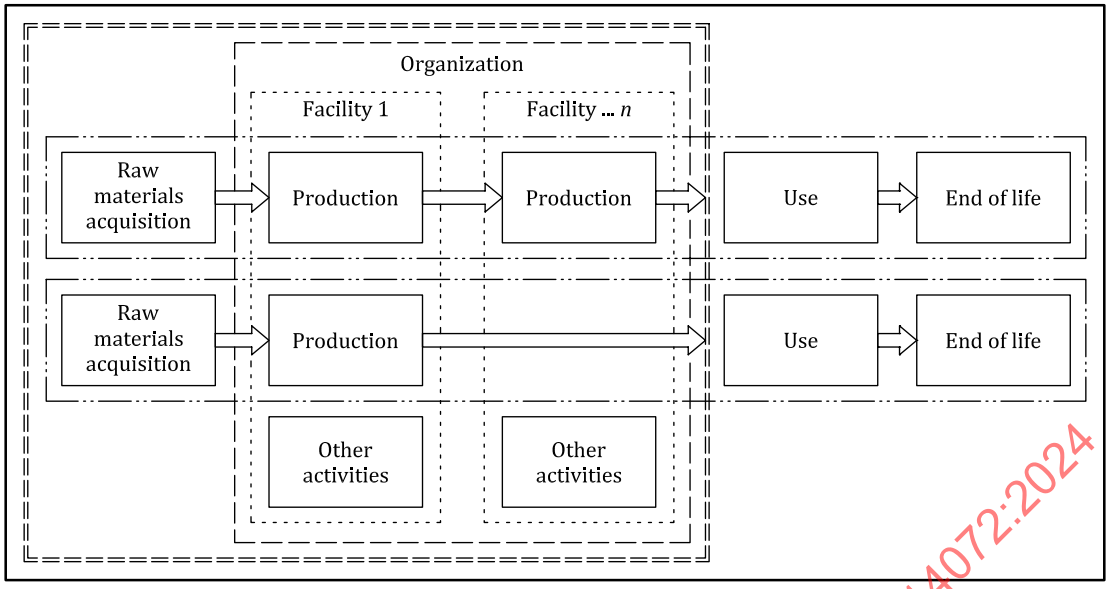
— the reasons for carrying out the study;

— the intended audience;

— a statement that the results are not intended to be used in comparative assertions intended to be disclosed to the public.

### 5.2.2 System boundary

According to its goal and scope, an organization can develop its OLCA based on defined system boundaries (see Figure 1).




**Key**

- boundaries for a facility
- boundaries for an organization
- life cycle boundaries for a product
- cradle-to-gate boundaries for an organization
- life cycle boundaries (cradle-to-grave) for an organization

**Figure 1 — Examples of different boundaries for inventory of organization**

The organization shall consider the complete life cycle to cover all inputs and outputs related to the organization's activities, and shall disclose and justify any exclusion.

A complete so-called "cradle-to-grave" assessment of an organization, as shown in Figure 1, includes the use and end-of-life treatment of sold products by the reporting organization in the reference period. This includes use stage resource use and emissions of sold products over their expected lifetime and the waste disposal and treatment of products sold by the reporting organization (in the reference period) at the end of their lives. Use stage flows should be included if products directly consume energy or generate emissions during use (e.g. automobiles, aircraft, power plants, buildings), or indirectly consume energy or cause emissions during use (e.g. apparel (requires washing and drying), food (requires cooking and refrigeration), or soaps and detergents (require heated water)).

Calculating input and outputs for the use stage typically requires product design specifications and assumptions about how consumers use products (e.g. use profiles, assumed product lifetimes).

If the organization has no influence on the use stage and the end-of-life stage of its products (e.g. through product design or recycling campaigns, which can occur, for example, for raw materials and intermediate products), it may select the cradle-to-gate boundary where the use and end-of-life stages are excluded. Selection of the cradle-to-gate boundary shall be justified and the justification included in any third-party report.

In accordance with ISO 14044:2006, 4.2.3.3, the system boundary shall be documented and justified in relation with the goal and scope of the study. For organizations, system boundaries shall reflect the consolidation approach.

The system boundary is defined considering a process-based approach and the additional operations of the organization (see Figure 1).

The organization can include one or more facilities/sites whose inputs and outputs typically result in environmental impacts. The organization shall consolidate its facilities/sites by one of the following consolidation approaches:

a) operational control: the organization assesses impacts of processes and physical units from facilities over which it has operational control;

b) financial control: the organization assesses impacts of processes and physical units from facilities over which it has financial control;

c) equity share: the organization assesses impacts of processes and physical units from respective facilities according to its share of equity interest.

When a facility is controlled by several organizations, these should adopt the same consolidation methodology.

The parts of the organization, which are accounted as assets and depreciated in the OLCA, shall be identified. The calculation methodology of LCI of these parts shall be clearly stated and documented.

For operations, the following applies:

— If the organization wholly owns and operates all its operations, its organizational boundaries are the same whichever consolidation methodology is used. In this case, the organization simply quantifies and reports all emissions from each of its wholly owned operations (see ISO/TR 14069).

— For organizations with jointly owned operations, however, the organizational boundaries differ depending on the consolidation methodology used, control or equity share (see ISO/TR 14069).

When assessing one organization, double counting shall be avoided.

In all cases, the organization shall document which consolidation methodology it applies. The organization shall explain any change to the selected consolidation methodology.

## 5.3 Specific considerations when dealing with LCI, LCIA and interpretation

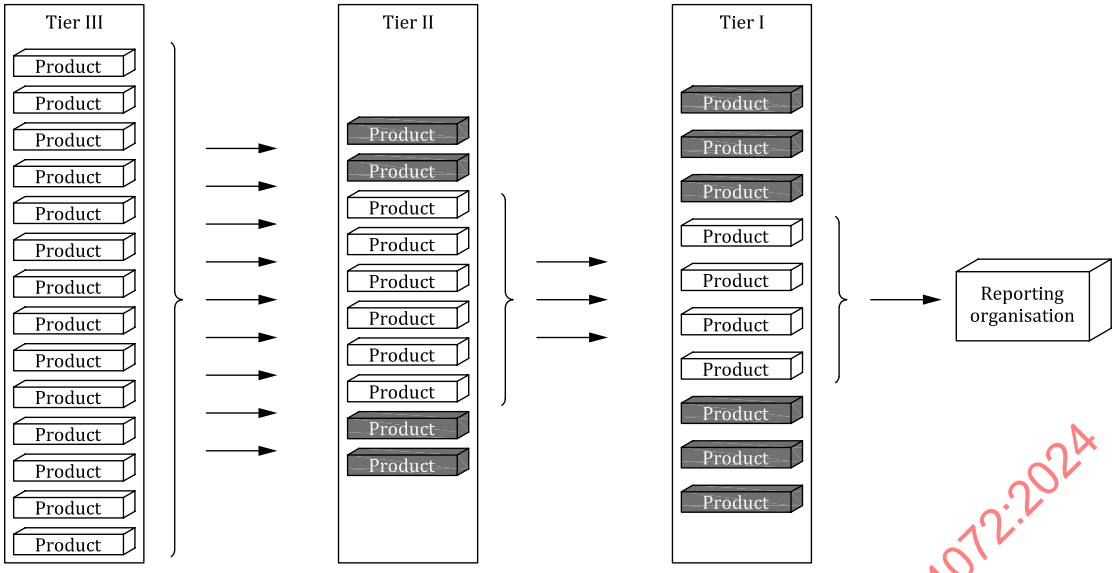
Some specific issues can occur when doing an OLCA.

For an OLCA, it is usually not suitable nor recommended to aggregate the OLCAs of the supply chain, because organizations usually neither purchase the whole product spectrum nor the total production volume of a particular supplier. Therefore, inputs and outputs of suppliers shall be allocated to the basket of products purchased from suppliers. This shall be done by using the allocation procedures described in ISO 14044 or, if consistent with the goal and scope of the study, by using data representative for the products purchased.

In dealing with aspects of LCI and LCIA for the OLCA, the significant potential environmental impacts shall be defined, based on knowledge of products, resources required and emissions. In order to develop the impact assessment, after the inventory calculation procedure as outlined in Annex D, the availability of data and the needs for the inventory shall be evaluated. In the interpretation phase, consideration and explanation of these issues shall be stated.

Figure 2 shows, as an example, an upstream supply chain composed of tier I, tier II and tier III suppliers. Each tier produces a number of products for the following tier until the products are delivered to the reporting organization. As long as all products from tier I, II and III are all completely involved in the reporting organization's product portfolio, no allocation problems arise.

However, if some products are not delivered to the reporting organization but are part of the supplier's products portfolio, they should not be accounted for. Hence, an allocation of the supplier's products portfolio should be performed in order to adjust to the products purchased by the organization.




**Key**

white shade reporting organization's product portfolio

grey shade products not delivered to the reporting organization

**Figure 2 — Possible upstream supply chain composed of tier I, tier II and tier III suppliers**

Therefore, even for an OLCA, a product perspective (e.g. purchased products) shall be taken when assessing the supply chain. To do so, product level data should be used and this represents the interface to the domain of LCA as defined in ISO 14040 and ISO 14044. The (theoretical) advantage of OLCA of not having to cope with numerous product life cycles does not necessarily apply anymore. From a conceptual perspective, there is no OLCA without a product perspective. The organization can get an overview of the environmental burdens of the different products which it purchases by collecting generic product LCA data (e.g. from data providers). For those products and impacts which contribute significantly to the overall burden, the suppliers should be approached to gain access to their specific data for updating the profile and for identifying options to reduce impact by product or process optimization of the existing supplier or choosing an alternative supplier with better performance.

Time periods represented by the data collected shall be clearly stated in the study. In addition, the time period which is assessed by the study shall be clearly stated, such as a financial year, or a period which contains some activities of an organization (e.g. average or mid-term plan).

Any modifications of the reporting unit, reference period or boundaries shall be clearly stated.

Data sources and data quality assessment together with uncertainty analysis (quantitative or qualitative) shall be carefully done when dealing with an organization:

— the influence of data quality on the interpretation shall be reported;

— the limitations associated with the uncertainty analysis shall be reported.

If financial information expressed in monetary unit regarding purchased products is used, care is expected when converting this financial information to physical flows due to the purchasing power parity (e.g. see Annex E).

Allocation rules, according to the goal and scope of the study, shall be carefully documented and justified (e.g. see Annex F).

If the OLCA is communicated to a third party, a critical review should be performed in accordance with ISO 14044 and ISO 14071.

# 6 Reporting

## 6.1 General requirements

The report content is described in Annex B. Reports shall be written according to Annex B.

## 6.2 The limitations regarding reporting

General requirements and guidance for communication are outside the scope of this document. This document can be applied to prepare input for communication, especially for performance tracking of an organization.

This document shall not be used for comparative assertions between different organizations intended to be disclosed to the public (e.g. ranking among organizations).

# Annex A
(normative)

# General requirements of ISO 14044 applicable or not applicable to this document

This annex presents:

— the requirements of ISO 14044:2006 that apply to organizations with no modifications, see Table A.1;

— the requirements from ISO 14044:2006 that are adapted for OLCA, see Table A.2.

**Table A.1 — Requirements of ISO 14044:2006 which apply with no modifications**

| Clause or subclause | Title |
|---|---|
| 4.1 | General requirements |
| 4.2.1 | General |
| 4.2.3.3 | System boundary |
| 4.2.3.4 | LCIA methodology and types of impacts |
| 4.2.3.6 | Data quality requirements |
| 4.2.3.8 | Critical review considerations |
| 4.3.2 | Collecting data |
| 4.3.3.1 | General |
| 4.3.3.2 | Validation of data |
| 4.3.3.4 | Refining the system boundary |
| 4.3.4.3 | Allocation procedures for reuse and recycling |
| 4.4.2.1 | General |
| 4.4.2.4 | Calculation of category indicator results (characterization) |
| 4.4.3 | Optional elements of LCIA |
| 4.5.2 | Identification of significant issues |
| 4.5.3.1 | General |
| 4.5.3.2 | Completeness check |
| 4.5.3.3 | Sensitivity check |
| 4.5.4 | Conclusions, limitations, and recommendations |

**Table A.2 — Requirements from ISO 14044:2006 that are adapted for OLCA**

| Clause and subclauses | Adapted requirements for OLCA |
|---|---|
| 4 Methodological framework for LCA<br>4.2 Goal and scope definition<br>4.2.2 Goal of the study<br>4.2.3 Scope of the study<br>4.2.3.1 General | In defining the goal of an LCA, the following items shall be unambiguously stated:<br>— the intended application;<br>— the reasons for carrying out the study;<br>— the intended audience, i.e. to whom the results of the study are intended to be communicated;<br>— a statement that the results are not intended to be used in comparative assertions intended to be disclosed to the public.<br>In defining the scope of an LCA, the following items shall be considered and clearly described:<br>— the organization to be studied;<br>— if the study is intended for monitoring of environmental performances over time;<br>— the reporting unit;<br>— the products, unit processes, facilities and sites of the organization included in the reporting unit;<br>— the reference period considered (e.g. for performance tracking);<br>— the system boundary;<br>— allocation procedures;<br>— LCIA methodology and types of impacts;<br>— interpretation to be used;<br>— data requirements;<br>— assumptions;<br>— value choices and optional elements;<br>— limitations;<br>— data quality requirements;<br>— type of critical review, if any;<br>— type and format of the report required for the study. |

**Table A.2** *(continued)*

| Clause and subclauses | Adapted requirements for OLCA |
|---|---|
| 4.2.3.2 Function and functional unit | The scope of an LCA shall clearly specify the following:<br>— The products and unit processes of the organization and the reporting unit of the organization being studied. The reporting unit shall be consistent with the goal and scope of the study. One of the primary purposes of a reporting unit is to provide a reference to which the input and output data are normalized (in a mathematical sense). Therefore, the reporting unit shall be clearly defined and measurable.<br>— Any exclusion of products and unit processes of the studied organization. |
| 4.3 Life cycle inventory analysis (LCI)<br>4.3.3 Calculating data<br>4.3.3.3 Relating data to unit process and functional unit | An appropriate flow shall be determined for each unit process. The quantitative input and output data of the unit process shall be calculated in relation to this flow.<br>The level of aggregation of the inputs and outputs shall be consistent with the goal of the study.<br>In general, assets such as buildings, factories and equipment are used over a time period which can be different from the time period fixed by the LCA. The calculation methodology of LCI of these assets should take into account the time period over which they are used. In that case, the calculation methodology shall be clearly justified and documented. |
| 4.3.4 Allocation<br>4.3.4.1 General | The inputs and outputs shall be allocated to the different products and unit processes according to clearly stated procedures that shall be documented and explained together with the allocation procedure.<br>The sum of the allocated inputs and outputs of a unit process shall be equal to the inputs and outputs of the unit process before allocation.<br>Whenever several alternative allocation procedures seem applicable, a sensitivity analysis shall be conducted to illustrate the consequences of the departure from the selected approach. |
| 4.3.4.2 Allocation procedure | The study shall identify the processes shared with other product systems or organizations, and deal with them according to the stepwise procedure consisting of three steps presented below.<br>a) Step 1: Wherever possible, allocation should be avoided by dividing the unit process to be allocated into two or more sub-processes and collecting the input and output data related to these sub-processes.<br>b) Step 2: Where allocation cannot be avoided, the inputs and outputs of the system should be partitioned between its different products or functions or unit processes or organizations in a way that reflects the underlying physical relationships between them, i.e. they should reflect the way in which the inputs and outputs are changed by quantitative changes in the products, functions, unit processes, or organizations delivered by the system.<br>c) Step 3: Where physical relationship alone cannot be established or used as the basis for allocation, the inputs should be allocated between the products and functions, or unit processes, or organizations in a way that reflects other relationships between them. For example, input and output data can be allocated between co-products in proportion to the economic value of the products or financial or operational control. |

**Table A.2** *(continued)*

| Clause and subclauses | Adapted requirements for OLCA |
|---|---|
| | Some outputs can be partly co-products and partly waste. In such cases, it is necessary to identify the ratio between co-products and waste since the inputs and outputs shall be allocated to the co-products part only.<br>Allocation procedures shall be uniformly applied to similar inputs and outputs of the system under consideration. For example, if allocation is made to usable products (e.g. intermediate or discarded products) leaving the system, then the allocation procedure shall be similar to the allocation procedure used for such products entering the system.<br>Changes in the inherent properties of materials shall be taken into account. In addition, particularly for the recovery processes between the original and subsequent product system, the system boundary shall be identified and explained, ensuring that the allocation principles are observed as described in 4.3.4.2. |
| 4.4 Life cycle impact assessment (LCIA)<br>4.4.1 General | The LCIA phase shall be carefully planned to achieve the goal and scope of an LCA study. The LCIA phase shall be coordinated with other phases of the LCA to take into account the following possible omissions and sources of uncertainty:<br>a) whether the quality of the LCI data and results is sufficient to conduct the LCIA in accordance with the study goal and scope definition;<br>b) whether the system boundary and data cut-off decisions have been sufficiently reviewed to ensure the availability of LCI results necessary to calculate indicator results for the LCIA;<br>c) whether the environmental relevance of the LCIA results is decreased due to the LCI reporting unit calculation, system-wide averaging, aggregation and allocation.<br>The LCIA phase includes the collection of indicator results for the different impact categories, which together represent the LCIA profile for the organization's activities.<br>The LCIA consists of mandatory and optional elements. |
| 4.4.2 Mandatory elements of LCIA<br>4.4.2.2 Selection of impact categories, category indicators, and characterization models | 4.4.2.2.1 Whenever impact categories, category indicators, and characterization models are selected in an LCA, the related information and sources shall be referenced. This also applies when new impact categories, category indicators, or characterization models are defined.<br>Accurate and descriptive names shall be provided for the impact categories and category indicators.<br>The selection of impact categories, category indicators and characterization models shall be both justified and consistent with the goal and scope of the LCA.<br>The selection of impact categories shall reflect a comprehensive set of environmental issues related to the organization being studied, taking the goal and scope into consideration.<br>The environmental mechanism and characterization model that relate the LCI results to the category indicator and provide a basis for characterization factors shall be described.<br>The appropriateness of the characterization model used for deriving the category indicator in the context of the goal and scope of the study shall be described.<br>LCI results other than mass and energy flow data included in an LCA (e.g. land use) shall be identified and their relationship to corresponding category indicators shall be determined. |

**Table A.2** *(continued)*

| Clause and subclauses | Adapted requirements for OLCA |
|---|---|
| 4.5 Life cycle interpretation<br>4.5.1 General | 4.5.1.1 The life cycle interpretation phase of an LCA or an LCI study comprises several elements as depicted in ISO 14044:2006, Figure 4, as follows:<br>— The results of the LCI or LCIA phases shall be interpreted according to the goal and scope of the study, and the interpretation shall include an assessment and a sensitivity check of the significant inputs, outputs and methodological choices in order to understand the uncertainty of the results.<br>— Interpretation shall consider any modifications of the reporting unit, reference period or boundaries.<br>4.5.1.2 The interpretation shall also consider the following in relation to the goal of the study:<br>— the appropriateness of the definitions of the reporting unit and system boundary;<br>— limitations identified by the data quality assessment and the sensitivity analysis.<br>The documentation of the data quality assessment, sensitivity analyses, conclusions and any recommendations from the LCI and LCIA results shall be checked. |

# Annex B
(normative)

# Reporting requirements of ISO 14044 applicable or not applicable to this document

This annex presents:

— the reporting requirements of ISO 14044:2006 that apply with no modifications, see Table B.1.

— the reporting requirements from ISO 14044:2006 that are adapted for OLCA, see Table B.2.

**Table B.1 — Reporting requirements of ISO 14044:2006 which apply with no modifications**

| Clause or subclause | Requirement |
|---|---|
| 5.1.1 | The type and format of the report shall be defined in the scope phase of the study. |

**Table B.2 — Reporting requirements from ISO 14044:2006 that are adapted for OLCA**

| Clause or subclause | Adapted requirements for OLCA |
|---|---|
| 5.1.2 In addition to the items in 5.1.1 and those listed in 5.2 c), the following items should be considered when preparing third-party reports: | a) modifications to the initial scope together with their justification;<br>b) system boundary, including:<br>— type of inputs and outputs of the system as elementary flows;<br>— decision criteria;<br>c) description of the unit processes, including:<br>— decision about allocation;<br>— description about the consolidation methodology within the organization;<br>d) data, including:<br>— decision about data;<br>— details about individual data;<br>— data quality requirements;<br>e) choice of impact categories and category indicators. |
| 5.2 Additional requirements and guidance for third-party reports | When results of the LCA are to be communicated to any third party (i.e. interested party other than the commissioner or the practitioner of the study), regardless of the form of communication, a third-party report shall be prepared.<br>The third-party report can be based on study documentation that contains confidential information that are not necessarily included in the third-party report.<br>The third-party report constitutes a reference document, and shall be made available to any third party to whom the communication is made. |

**Table B.2** *(continued)*

| Clause or subclause | Adapted requirements for OLCA |
|---|---|
| | The third-party report shall cover the following aspects.<br>a) General aspects:<br>1) LCA commissioner, practitioner of LCA (internal or external);<br>2) date of report;<br>3) statement that the study has been conducted in accordance with the requirements of ISO 14044 and of this document.<br>b) Goal of the study:<br>1) reasons for carrying out the study;<br>2) its intended applications;<br>3) the target audiences;<br>4) a statement that the results are not intended to be used in comparative assertions intended to be disclosed to the public.<br>c) Scope of the study:<br>1) reporting unit (specified time period), including:<br>i) consistency with goal and scope;<br>ii) statement of performance characteristics;<br>iii) definition;<br>iii) result of performance measurement;<br>2) system boundary, including:<br>i) description of the consolidation methodology chosen;<br>ii) omissions of life cycle stages, processes or data needs;<br>iii) quantification of energy and material inputs and outputs:<br>iv) assumptions about electricity production;<br>3) cut-off criteria for initial inclusion of inputs and output, including:<br>i) description of cut-off criteria and assumptions;<br>ii) effect of selection on results;<br>iii) inclusion of mass, energy, and environmental cut-off criteria.<br>d) Life cycle inventory analysis:<br>1) data collection procedures;<br>2) qualitative and quantitative description of unit processes; or other operations according to goal and scope;<br>3) sources of published literature;<br>4) calculation procedures;<br>5) validation of data, including:<br>i) data quality assessment;<br>ii) treatment of missing data;<br>6) sensitivity analysis for refining the system boundary;<br>7) allocation principles and procedures, including: |

**Table B.2** *(continued)*

| Clause or subclause | Adapted requirements for OLCA |
|---|---|
| | i) documentation and justification of allocation procedures;<br>ii) uniform application of allocation procedures;<br>iii) description about the consolidation methodology within the organization.<br>e) Life cycle impact assessment, where applicable:<br>1) the LCIA procedures, calculations, and results of the study;<br>2) limitations of the LCIA results relative to the defined goal and scope of the LCA;<br>3) the relationship of LCIA results to the defined goal and scope, see ISO 14044:2006, 4.2;<br>4) the relationship of the LCIA results to the LCI results, see ISO 14044:2006, 4.4;<br>5) impact categories and category indicators considered, including a rationale for their selection and a reference to their source;<br>6) descriptions of or reference to all characterization models, characterization factors, and methodology used, including all assumptions and limitations;<br>7) descriptions of or reference to all value-choices used in relation to impact categories, characterization models, characterization factors, normalization, grouping, weighting, and, elsewhere in the LCIA, a justification for their use and their influence on the results, conclusions, and recommendations;<br>8) a statement that the LCIA results are relative expressions and do not predict impacts on category end points, the exceeding of thresholds, safety margins or risks and, when included as a part of the LCA, also:<br>i) a description and justification of the definition and description of any new impact categories, category indicators, or characterization models used for the LCIA;<br>ii) a statement and justification of any grouping of the impact categories;<br>iii) any further procedures that transform the indicator results and a justification of the selected references, weighting factors, etc.;<br>iv) any analysis of the indicator results, e.g. sensitivity and uncertainty analysis or the use of environmental data, including any implication for the results;<br>v) data and indicator results reached prior to any normalization, grouping, or weighting shall be made available together with the normalized, grouped or weighted results.<br>f) Life cycle interpretation:<br>1) the results;<br>2) assumptions and limitations associated with the interpretation of results, both methodology and data related;<br>3) data quality assessment;<br>4) full transparency in terms of value-choices, rationales and expert judgements. |

**Table B.2** *(continued)*

| Clause or subclause | Adapted requirements for OLCA |
|---|---|
| | g) Critical review, where applicable:<br>1) name and affiliation of reviewers;<br>2) critical review reports;<br>3) responses to recommendations. |
| New subclause: 5.4 Further reporting requirements for performance tracking over time | 5.4 Further reporting requirements for performance tracking within time:<br>— Structural changes to the organization should be identified, and their effect on the results of the OLCA for the relevant time period explained (e.g. merger and acquisition, BU sales, outsourcing, number of employees) |

# Annex C
(informative)

# Example of an OLCA application including performance tracking

## C.1 General

This annex provides an example OLCA for a Hotel Group, where a life cycle approach was applied to assess the organization's environmental performance.

## C.2 The Hotel Group's background and ambition

An international hotel group operates in 90 countries with more than 4 000 hotels. The group is an owner, operator and franchisor. This organization seeks to understand and improve its environmental performance from a life cycle perspective.

## C.3 Example approach of an OLCA

The Hotel Group developed a customized approach to the assessment of the group's environmental impact that can be defined as "a multi-criteria measure of the environmental performance of an organization from a life-cycle perspective".

This approach was largely inspired by the LCA principles and mainly guided by the following principles:

— Life-cycle thinking perspective: Impacts were investigated for the upstream suppliers (food suppliers, laundry cleaning contractors, construction, etc.), hotels on-site, headquarter activities and downstream suppliers (on-site waste treatment, end-of-life of buildings).

— Multi-criteria approach: The assessment included all relevant environmental indicators associated with the Hotel Group's activities.

— Relevance, completeness, appropriate sources, data and methodology were selected to assess the environmental footprint. The assessment included as far as possible all relevant life cycle stages of the Hotel Group activities.

— Transparency: Due to the complexity of the study, all methodological choices were discussed and results presented with limitations. A critical review was also conducted to ensure the accuracy and reliability of the study.

## C.4 Methodology

### C.4.1 General

The methodological steps chosen were largely inspired by the phases described in ISO 14040, with the challenge to adapt them to the level of an organization.

### C.4.2 Goal and scope definition

The Hotel Group's goal was to quantify metrics on its global potential environmental impacts, which led to building a specific methodology to provide accurate information about the real environmental issues of the Hotel Group's activity, beyond intuitions (not just $CO_2$, not focus on on-site activities), and thereby to building the best possible strategy to curb its impacts and generate value for the group.

The reporting unit was defined as: “Hosting all the clients of the Hotel Group during one year, over the world, considering all the basic services including restauration”.

When defining the boundaries of the organization, major parts of the scope covered by the Hotel Group's accommodation services (including hotels, due to operational control) were assessed.

The system studied was selected through a hotel life cycle perspective (raw materials, manufacturing, distribution, use and end-of-life) and split into 11 activities, covering the Hotel Group’s responsibility scope. Some exclusions were made when there was not enough information or when the contribution was negligible. Figure C.1 shows the 11 activities selected.

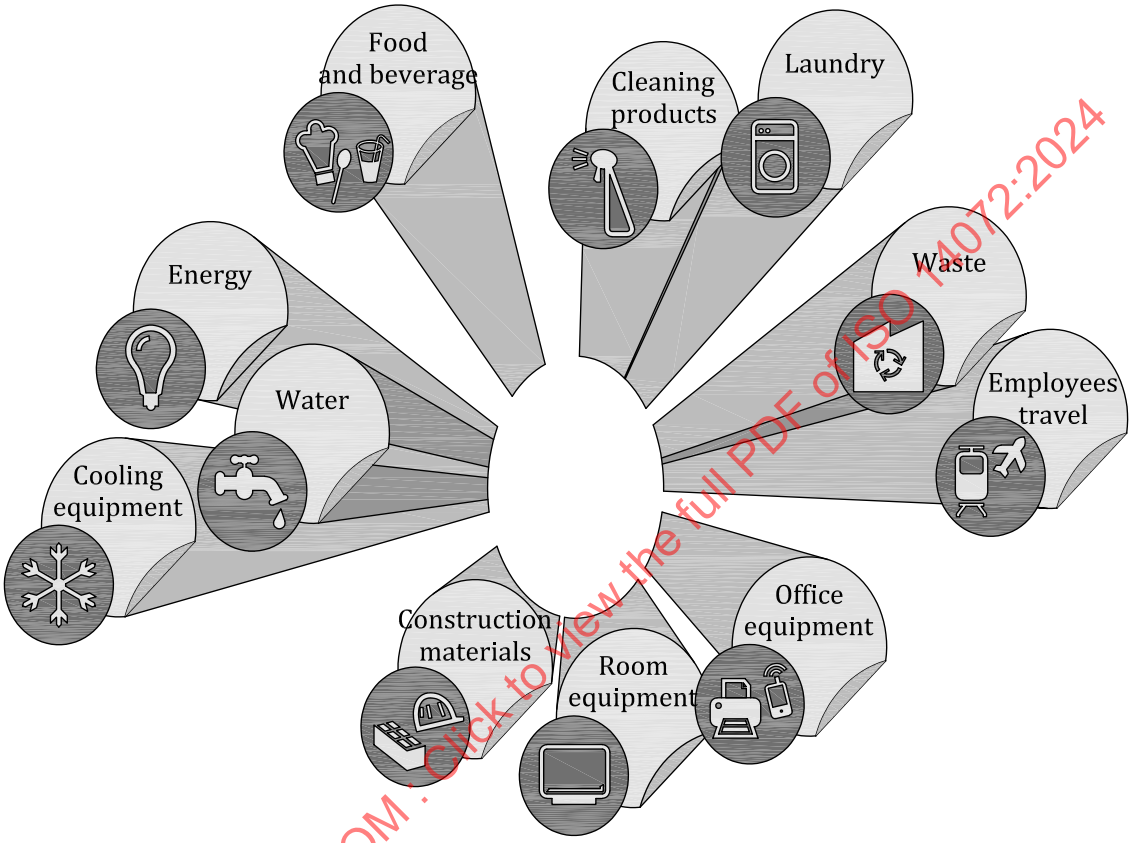



**Figure C.1 — The 11 activities of the Hotel Group's accommodation service covered in the study**

All the inputs and outputs compiled at the organizational boundaries have an impact on the environment. Environmental impact indicators studied for this environmental footprint were selected according to:

— their relevance to the accommodation services sector environmental impacts and the Hotel Group’s environmental programme priorities and their understandability, in order to raise awareness on the main results for the interested parties of the Hotel Group;

— the availability of a reliable assessment methodology.

Therefore, energy consumption (as the primary resource), ultimate waste production, climate change and eutrophication were then selected for this study. The Hotel Group also had a major concern about the impact it could have on toxicity, eco-toxicity and biodiversity; however, these impacts could not be evaluated due to a lack of available indicators.