ISO 14046

Environmental management

Water footprint — Principles, requirements and guidelines

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Executive summary

— This International Standard specifies principles, requirements and guidelines related to water footprint assessment of products, processes and organizations based on life cycle assessment.

— This International Standard provides transparency, consistency, reproducibility and credibility for assessing and reporting the water footprint of products, processes or organizations.

— A water footprint assessment identifies potential environmental impacts related to water, identifies quantity of water use and changes in water quality, includes relevant geographical and temporal dimensions, utilizes hydrological knowledge and is modular.

— A water footprint assessment can assist in assessing the magnitude of potential environmental impacts related to water, in identifying opportunities to reduce water related potential environmental impacts, in strategic risk management related to water, in facilitating water efficiency and optimization of water management, in informing decision-makers of potential environmental impacts related to water, and in providing consistent and reliable information, based on scientific evidence for reporting water footprint results.

— A water footprint assessment can be conducted and reported as a stand-alone assessment, or as part of a comprehensive life cycle assessment of all environmental impacts.

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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).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is Technical Committee ISO/TC 207, *Environmental management*, Subcommittee SC 5, *Life cycle assessment*.

Introduction

Water is an essential natural resource.

The issue of water and its management has become increasingly central to the global debate on sustainable development. This interest has been driven by growing water demand, increasing water scarcity in many areas and/or degradation of water quality. This drives the need for a better understanding of water related impacts as a basis for improved water management at local, regional, national and global levels.

It is therefore desirable to have appropriate assessment techniques that can be used in an internationally consistent manner.

One of the techniques being developed for this purpose is the water footprint assessment.

There is a growing demand for assessing and reporting water footprints. Various methodologies exist to do so and currently these methodologies emphasise different aspects related to water. There is therefore a need to ensure consistency in assessing and reporting water footprints.

This International Standard is expected to benefit organizations, governments and other interested parties worldwide by providing transparency, consistency, reproducibility and credibility for assessing and reporting the water footprint of products, processes or organizations.

A water footprint assessment conducted according to this International Standard:

— is based on a life cycle assessment (according to ISO 14044);

— is modular (i.e. the water footprint of different life cycle stages can be summed to represent the water footprint);

— identifies potential environmental impacts related to water;

— includes relevant geographical and temporal dimensions;

— identifies quantity of water use and changes in water quality;

— utilizes hydrological knowledge.

A water footprint assessment can assist in:

a) assessing the magnitude of potential environmental impacts related to water;

b) identifying opportunities to reduce water related potential environmental impacts associated with products at various stages in their life cycle as well as processes and organizations;

c) strategic risk management related to water;

d) facilitating water efficiency and optimization of water management at product, process and organizational levels;

e) informing decision-makers in industry, government or non-governmental organizations of their potential environmental impacts related to water (e.g. for

the purpose of strategic planning, priority setting, product or process design or redesign, decisions about investment of resources);

f) providing consistent and reliable information, based on scientific evidence for reporting water footprint results.

A water footprint assessment alone is insufficient to be used to describe the overall potential environmental impacts of products, processes or organizations.

The water footprint assessment according to this International Standard can be conducted and reported as a stand-alone assessment, where only impacts related to water are assessed, or as part of a life cycle assessment, where consideration is given to a comprehensive set of environmental impacts and not only impacts related to water.

In this International Standard, the term "water footprint" is only used when it is the result of an impact assessment.

The specific scope of the water footprint assessment is defined by the users of this International Standard in accordance with its requirements.

NOTE 1 In this International Standard, the term "product" includes services.

NOTE 2 In this International Standard, the term "environmental impacts" includes categories generally found in impact models used in life cycle assessment, such as impacts on ecosystems, on human health and on resources.

NOTE 3 Reporting is different from communication. Requirements and guidelines for reporting are included in this International Standard, but requirements and guidelines for communication, such as environmental labels or declarations, are outside the scope of this International Standard.

1 Scope

This International Standard specifies principles, requirements and guidelines related to water footprint assessment of products, processes and organizations based on life cycle assessment (LCA).

This International Standard provides principles, requirements and guidelines for conducting and reporting a water footprint assessment as a stand-alone assessment, or as part of a more comprehensive environmental assessment.

Only air and soil emissions that impact water quality are included in the assessment, and not all air and soil emissions are included.

The result of a water footprint assessment is a single value or a profile of impact indicator results.

Whereas reporting is within the scope of this International Standard, communication of water footprint results, for example in the form of labels or declarations, is outside the scope of this International Standard.

NOTE Specific requirements and guidelines for organizations are given in Annex A.

2 Normative references

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

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

3 Terms and definitions

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

3.1 Terms relating to types and classifications of water

3.1.1
freshwater
water having a low concentration of dissolved solids

Note 1 to entry: Freshwater typically contains less than 1 000 mg/l of dissolved solids and is generally accepted as suitable for withdrawal and conventional treatment to produce potable water.

Note 2 to entry: The concentration of total dissolved solids can vary considerably over space and/or time.

3.1.2
brackish water
water containing dissolved solids at a concentration less than that of *seawater* (3.1.4), but in amounts that exceed normally acceptable standards for municipal, domestic and irrigation uses

Note 1 to entry: The concentration of total dissolved solids in brackish water can vary from 1 000 mg/l to 30 000 mg/l.

Note 2 to entry: The concentration of total dissolved solids of many brackish waters can vary considerably over space and/or time.

3.1.3
surface water
water in overland flow and storage, such as rivers and lakes, excluding *seawater* (3.1.4)

3.1.4
seawater
water in a sea or an ocean

Note 1 to entry: Seawater has a concentration of dissolved solids greater than or equal to 30 000 mg/l.

3.1.5
groundwater
water which is being held in, and can be recovered from, an underground formation

[SOURCE: ISO 11074:2005, 3.2.2, modified — Note has been removed.]

3.1.6
fossil water
groundwater (3.1.5) that has a negligible rate of natural recharge on the human time-scale

Note 1 to entry: The term "non-renewable water" is sometimes used for this concept.

3.1.7
water body
entity of water with definite hydrological, hydrogeomorphological, physical, chemical and biological characteristics in a given geographical area

EXAMPLE Lakes, rivers, groundwaters, seas, icebergs, glaciers and reservoirs.

Note 1 to entry: In case of availability, the geographical resolution of a water body should be determined at the goal and scope stage: it may regroup different small water bodies.

3.1.8
drainage basin
area from which direct surface runoff from precipitation drains by gravity into a stream or other *water body* (3.1.7)

Note 1 to entry: The terms "watershed", "drainage area", "catchment", "catchment area" or "river basin" are sometimes used for the concept of "drainage basin".

Note 2 to entry: Groundwater drainage basin does not necessarily correspond in area to surface drainage basin.

Note 3 to entry: The geographical resolution of a drainage basin should be determined at the goal and scope stage: it may regroup different sub drainage basins.

3.1.9
elementary water flow
water entering the system being studied that has been drawn from the environment, or water leaving the system being studied that is released into the environment

[SOURCE: ISO 14044:2006, 3.12, modified]

3.2 Terms relating to water

3.2.1
water use
use of water by human activity

Note 1 to entry: Use includes, but is not limited to, any *water withdrawal* (3.2.2), water release or other human activities within the *drainage basin* (3.1.8) impacting water flows and/or quality, including in-stream uses such as fishing, recreation, transportation.

Note 2 to entry: The term "water consumption" is often used to describe water removed from, but not returned to, the same drainage basin. Water consumption can be because of evaporation, transpiration, integration into a product, or release into a different drainage basin or the sea. Change in evaporation caused by land-use change is considered water consumption (e.g. reservoir). The temporal and geographical coverage of the *water footprint assessment* (3.3.2) should be defined in the goal and scope.

3.2.2
water withdrawal
anthropogenic removal of water from any *water body* (3.1.7) or from any *drainage basin* (3.1.8), either permanently or temporarily

Note 1 to entry: The term "water abstraction" is sometimes used for this concept.

3.2.3
water degradation
negative change in *water quality* (3.2.4)

3.2.4
water quality
physical (e.g. thermal), chemical and biological characteristics of water with respect to its suitability for an intended use by humans or ecosystems

3.3 Terms relating to life cycle assessment and water footprint assessment

3.3.1
water footprint
metric(s) that quantifies the potential environmental impacts related to water

Note 1 to entry: If water related potential environmental impacts have not been comprehensively assessed, then the term "water footprint" can only be applied with a qualifier. A qualifier is one or several additional words used in conjunction with the term "water footprint" to describe the impact category/categories studied in the water footprint assessment, e.g. "water scarcity footprint", "water eutrophication footprint", "non-comprehensive water footprint".

3.3.2
water footprint assessment
compilation and evaluation of the inputs, outputs and the potential environmental impacts related to water used or affected by a product, process or organization

Note 1 to entry: In this International Standard, the term "study" is often used as synonym for "water footprint assessment".

3.3.3
comprehensive water footprint assessment
water footprint assessment (3.3.2) that fulfils the principle of comprehensiveness

Note 1 to entry: The principle of comprehensiveness implies to consider all environmentally relevant attributes or aspects of natural environment, human health and resources related to water, including *water availability* (3.3.16) and *water degradation* (3.2.3).

3.3.4
life cycle
consecutive and interlinked stages of a product system, from raw material acquisition or generation from natural resources to final disposal

[SOURCE: ISO 14044:2006, 3.1]

3.3.5
life cycle assessment
LCA
compilation and evaluation of the inputs, outputs and the potential environmental impacts of a product system throughout its *life cycle* (3.3.4)

[SOURCE: ISO 14044:2006, 3.2]

3.3.6
life cycle inventory analysis
LCI
phase of *life cycle assessment* (3.3.5) involving the compilation and quantification of inputs and outputs for a product throughout its *life cycle* (3.3.4)

[SOURCE: ISO 14044:2006, 3.3]