GUIDE 84

First edition
2020-07

Guidelines for addressing climate change in standards

Lignes directrices pour la prise en compte des changements climatiques dans les normes

Reference number
ISO GUIDE 84:2020(E)

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Published in Switzerland

Contents

Page

Foreword ..... **v**

Introduction ..... **vi**

1 Scope **1**

2 Normative references **1**

3 Terms, definitions and abbreviated terms **1**
3.1 Terms and definitions 1
3.2 Abbreviated terms 8

4 Understanding and responding to climate change **8**
4.1 What is climate change? 8
4.2 Climate change mitigation and adaptation to climate change 9
4.2.1 General 9
4.2.2 Climate change mitigation 9
4.2.3 Adaptation to climate change 10
4.2.4 Interrelation between climate change mitigation and adaptation to climate change 10

5 Addressing climate change in standards **10**
5.1 General 10
5.2 Principles related to addressing climate change in standards 11
5.2.1 General 11
5.2.2 Interactivity 11
5.2.3 Clarity 11
5.2.4 Involvement of interested parties 11
5.2.5 Transparency 11
5.2.6 Fairness and equity 12
5.2.7 Performance-driven approach 12
5.2.8 Future orientation 12

6 Planning the strategy **12**
6.1 General 12
6.2 Issues to think about before establishing a committee 13
6.3 Strategic business plan 13
6.4 Review and revision of standards 14

7 Planning the content **15**
7.1 Responsibilities 15
7.2 Understanding approaches to responding to climate change 15
7.2.1 General 15
7.2.2 Systems approach 16
7.2.3 Life cycle approach 16
7.2.4 Risk-based approach 18
7.2.5 Precautionary approach 19
7.3 Identifying climate change issues 19
7.3.1 General 19
7.3.2 Identifying relevant climate change issues 21
7.3.3 Identifying significant climate change issues 21

8 Addressing climate change issues **22**
8.1 General 22
8.2 Consider interrelations between adaptation and mitigation 22
8.3 Addressing climate change mitigation when dealing with specific sources 23
8.3.1 General 23
8.3.2 GHG emissions from the direct or indirect combustion of fuels and energy efficiency 24
8.3.3 GHG emissions from the use of fluorinated industrial gases 25

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8.3.4 GHG emissions from the process industries 25
8.3.5 GHG emissions from agriculture 25
8.3.6 GHG emissions from livestock operations 25
8.3.7 GHG emissions from waste management 26
8.3.8 GHG emissions from biomass and natural processes 26
8.3.9 GHG emissions from road transportation fuels 26
8.3.10 GHG emissions from the aviation sector 26
8.3.11 GHG emissions from maritime shipping 27
8.4 Mitigation approaches 27
8.4.1 GHG reduction through energy management and energy efficiency 27
8.4.2 GHG reduction through renewable energy 27
8.4.3 GHG reduction through fuel switching 28
8.4.4 GHG reduction through resource management 28
8.4.5 Carbon capture, use, and storage 28
8.5 Financing the transition to a low carbon economy 28
8.5.1 General 28
8.5.2 Policy incentives 29
8.5.3 Green debt instruments 29
8.5.4 Mitigation projects 30
8.6 Addressing climate change adaptation aspects in product and process standards 30
8.6.1 General 30
8.6.2 Considerations and approaches for adaptation 31
8.6.3 Incorporating climate change adaptation measures into standards 32
8.6.4 Process standards 34
8.6.5 Product standards 34
8.7 Adaptation and mitigation in management system standards 36
8.8 Other aspects for consideration 38
8.8.1 Organizational inventories 38
8.8.2 GHG project monitoring 39
8.8.3 Per unit of product “footprints” 39
8.8.4 Role of verification in monitoring and evaluation 40

Annex A (informative) **Using systems thinking to set boundaries for climate change adaptation 41**

Annex B (informative) **Background information on approaches for responding to climate change 45**

Annex C (informative) **Planetary boundary conditions 51**

Annex D (informative) **Adaptation to climate change and climate change mitigation: Examples and supporting information 53**

Bibliography 59

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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).

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 the ISO Technical Management Board Task Force on Climate Change Coordination.

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

This document is intended for developers of ISO standards and other deliverables to encourage the inclusion of provisions in standards to address climate change impacts, risks and opportunities, and aims to:

— enable standards committees to determine if the standard under consideration should take into account aspects, issues, impacts, risks and/or opportunities associated with climate change;

— provide standards developers with a systematic approach to address climate change impacts, risks and opportunities in a coherent and consistent manner, with regard to both new and revised standards, and in a manner related to the objective and scope of the standard being developed;

— promote consistency and compatibility to the extent practical among standards that directly or indirectly address climate change and their wider uptake in support of sustainability.

NOTE Standards developers are encouraged to consider the mandatory committee-specific policies in the ISO/IEC Directives, Part 1, for the development of sector-specific environmental management standards and sector-specific environmental management system standards.

Figure 1 provides a schematic overview of this document as a process for addressing climate change in standards.

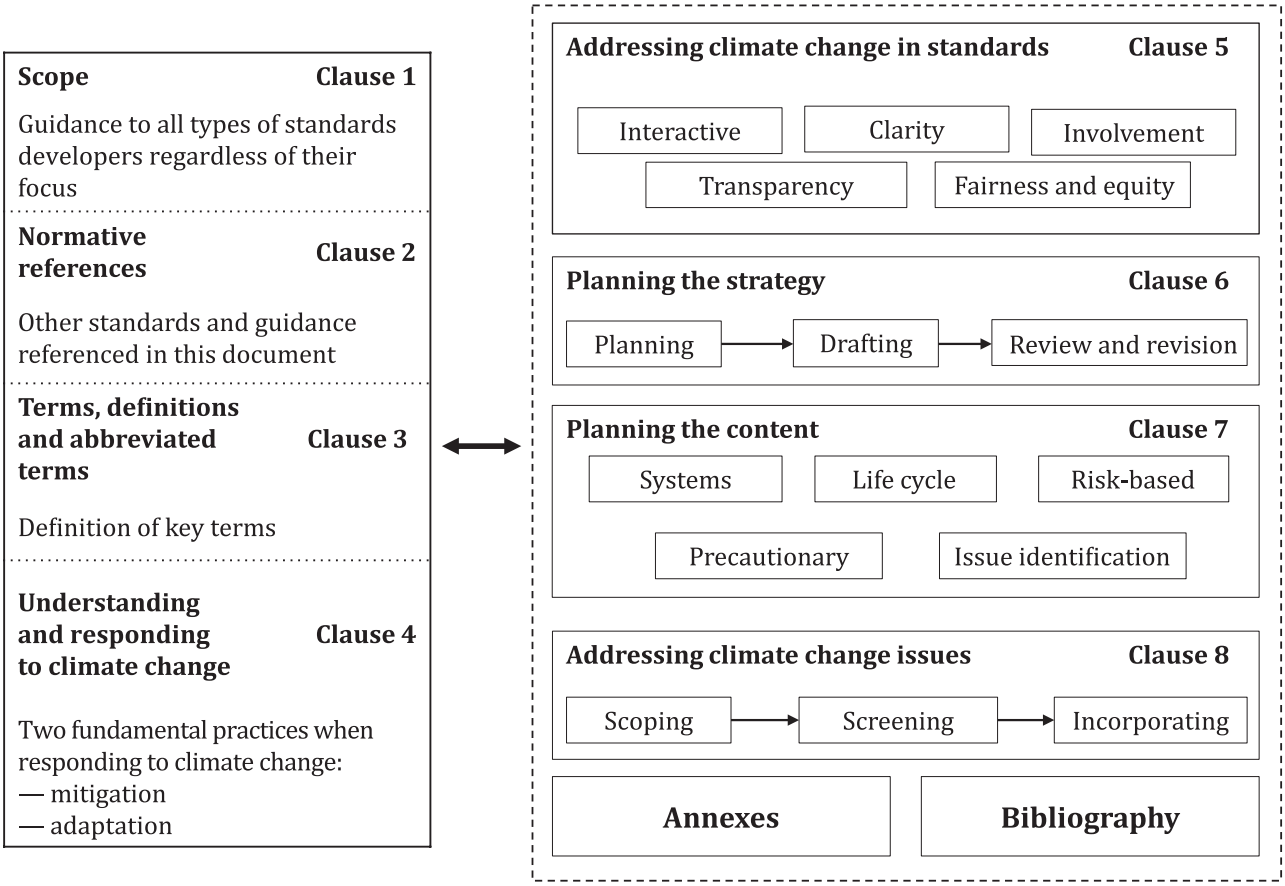

Figure 1 — Schematic overview of this document

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The international community has expressed a commitment to strengthen the global response to the threat of climate change, in the context of sustainable development, including:

a) holding the increase in the global average temperature to below 2 °C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1,5 °C above pre-industrial levels, recognizing that this would significantly reduce the negative climate change impacts;

b) increasing the ability to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development, in a manner that does not threaten food production.

Climate change affects many regions of the world and includes significant climate change impacts, risks and opportunities arising from changing weather patterns, rising sea levels and more extreme weather events. Rapidly expanding urban areas are recognized to be particularly vulnerable. Climate extremes affecting urban systems, such as power supplies, can lead to cascading failures in other utilities and services compromising the health and well-being of the population. The potential consequences of such climate-related impacts, risks and opportunities include the disruption of different environmental, social and economic systems within national economies, affecting communities and organizations, as well as individuals, with the poorest and most vulnerable people expected to be affected the most. Action is needed, involving both climate change adaptation and mitigation, in order to limit the effects of climate change impacts, risks and opportunities, while also contributing to the reduction of the world's average surface temperature. Against this challenging outlook, the scope, need and opportunity for action on climate change is extensive.

Climate change is acknowledged as a foremost challenge with regards to the goal of sustainable development, which encompasses any state of the global system in which the needs of the present are met without compromising the ability of future generations to meet their own needs.

Standards that take into consideration climate change adaptation and/or mitigation can contribute to the achievement of sustainability, either directly (where they specifically address sustainability issues such as climate change) or indirectly (where they relate to testing, products, procedures, services, terminology, management systems or assessment). It is recognized that both climate change mitigation (CCM) and adaptation to climate change (ACC) are important for all processes related to a technology, activity or product (TAP). Although there are very important interactions, the two disciplines are distinct and are addressed individually within this document.

Standards developers are encouraged to consider climate change issues in their work at all stages in the standards development process. If climate change issues have not been considered, this can be a valid reason to start the revision of a standard. In addition, the significance or relevance of specific issues can have changed since the previous edition of a standard was drafted or reviewed. Whenever a new standard is drafted, or an existing standard is revised, all standards developers (including project leaders, convenors, committee chairs, committee managers and secretaries) are encouraged to actively promote the application of this document, and to involve experts knowledgeable in the subject.

When standards developers address climate change in different existing or new standards, the result can be an increased awareness of climate change issues among the user community across various market sectors. Through the application of this document, users of such standards will be better able to address climate change mitigation and/or adaptation in ways that many would not have expected or considered. And with entirely new standards, users will realize that there are new opportunities for the market to respond to these issues in ways not previously considered or contemplated.

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Guidelines for addressing climate change in standards

1 Scope

This document provides guidance to standards developers on how to take account of climate change in the planning, drafting, revision and updating of ISO standards and other deliverables.

It outlines a framework and general principles that standards developers can use to develop their own approach to addressing climate change on a subject-specific basis.

It aims to enable standards developers to include adaptation to climate change (ACC) and climate change mitigation (CCM) considerations in their standardization work. Considerations related to ACC are intended to contribute to increasing preparedness and disaster reduction as well as impacting the resilience of organizations and their technologies, activities or products (TAPs). Considerations related to CCM consist primarily of approaches that seek to avoid, reduce or limit the release of GHG emissions and/or increase GHG removals.

2 Normative references

There are no normative references in this document.

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

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

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

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

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

3.1.1
climate
statistical description of weather in terms of the mean and variability of relevant quantities over a period of time ranging from months to thousands or millions of years

Note 1 to entry: The classical period for averaging these variables is 30 years, as defined by the World Meteorological Organization.

Note 2 to entry: The relevant quantities are most often near-surface variables such as temperature, precipitation and wind.

[SOURCE: ISO 14090:2019, 3.4]

3.1.2
climate change
change in *climate* (3.1.1) that persists for an extended period, typically decades or longer

Note 1 to entry: Change in climate can be identified (e.g. by using statistical tests) by changes in the mean and/or the variability of its properties.

Note 2 to entry: Climate change might be due to natural processes, internal to the climate system, or external forcings such as modulations of the solar cycles, volcanic eruptions, and persistent *anthropogenic* (3.1.36) changes in the composition of the atmosphere or in *land use* (3.1.37).

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[SOURCE: ISO 14090:2019, 3.5, modified — Note 1 to entry has been modified.]

3.1.3
adaptation to climate change
climate change adaptation
adaptation
process of adjustment to actual or expected *climate* (3.1.1) and its effects

Note 1 to entry: In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities.

Note 2 to entry: In some natural systems, human intervention can facilitate adjustment to expected climate and its effects.

[SOURCE: ISO 14090:2019, 3.1, modified — The preferred term "adaptation" has been added.]

3.1.4
climate change mitigation
mitigation
human intervention to reduce *GHG emissions* (3.1.13) or enhance *GHG removals* (3.1.14)

[SOURCE: ISO 14080:2018, 3.1.2.1, modified — The preferred term "mitigation" has been added, and the words "to reduce the sources or enhance the sinks of greenhouse gases (GHGs)" have been replaced with "to reduce GHG emissions or enhance GHG removals" in the definition.]

3.1.5
climate change impact
effect on natural or human systems as a result of being exposed to *climate change* (3.1.2)

Note 1 to entry: Impacts can be adverse or beneficial.

[SOURCE: ISO 14090:2019, 3.8, modified — The preferred term and definition have been contextualized to directly refer to climate change: the term "impact" has been replaced with "climate change impact", the words "as a result of being exposed to climate change" have been added to the definition and the original Note 1 to entry has been replaced.]

3.1.6
climate change risk
risk (3.1.7) of negative *climate change impacts* (3.1.5) that reflects the interaction among *vulnerability* (3.1.8), *exposure* (3.1.10) and *hazard* (3.1.11)

Note 1 to entry: A risk assessment can include the consideration of vulnerabilities, exposure and *climate change* (3.1.2) hazards, or the consideration of *likelihoods* (3.1.44) and *consequences* (3.1.43).

[SOURCE: ISO 14080:2018, 3.1.3.3, modified — The preferred term has been changed from "climate risk" to "climate change risk", the words "potential of negative impacts of climate change" have been replaced with "risk of negative climate change impacts", and the original Note 1 to entry has been replaced.]

3.1.7
risk
effect of uncertainty on objectives

Note 1 to entry: An effect is a deviation from the expected. It can be positive, negative or both, and can address, create or result in opportunities and threats.

Note 2 to entry: Objectives can have different aspects and categories, and can be applied at different levels.

Note 3 to entry: Risk is usually expressed in terms of *risk sources* (3.1.41), potential *events* (3.1.42), their *consequences* (3.1.43) and their *likelihood* (3.1.44).

[SOURCE: ISO 31000:2018, 3.1]

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3.1.8
vulnerability
propensity or predisposition to be adversely affected by *climate* (3.1.1) variability or *change* (3.1.2)

Note 1 to entry: Vulnerability encompasses a variety of concepts and elements including *sensitivity* (3.1.9) or susceptibility to harm and lack of capacity to cope and adapt.

[SOURCE: ISO 14090:2019, 3.15, modified —The definition has been contextualized to directly refer to climate variability or change: the words "by climate variability or change" have been added to the definition.]

3.1.9
sensitivity
degree to which a system or species is affected, either adversely or beneficially, by *climate* (3.1.1) variability or *change* (3.1.2)

[SOURCE: ISO 14080:2018, 3.1.3.7, modified — The note to entry has been removed.]

3.1.10
exposure
presence of people, livelihoods, species or ecosystems, environmental functions, services, resources, infrastructure, or economic, social, or cultural assets in places and settings that could be adversely affected by *climate* (3.1.1) variability or *change* (3.1.2)

Note 1 to entry: Exposure can change over time, for example as a result of *land use* (3.1.37) change.

[SOURCE: ISO 14090:2019, 3.6, modified — The definition has been contextualized to directly refer to effect of climate change and climate variability: the term "affected" has been replaced by "adversely affected by climate variability or change" in the definition.]

3.1.11
hazard
potential source of injury or damage to the health of people, or damage to property or the environment

Note 1 to entry: The potential for harm can be in terms of loss of life, injury or other health impacts, as well as damage and loss to property, infrastructure, livelihoods, service provision, ecosystems and environmental resources.

Note 2 to entry: In this document, the term usually refers to climate-related physical *events* (3.1.42) or trends or their physical impacts.

Note 3 to entry: Hazard comprises slow-onset developments (e.g. rising temperatures over the long term) as well as rapidly developing climatic extremes (e.g. a heatwave or a landslide) or increased variability.

[SOURCE: ISO 14090:2019, 3.7, modified — The word "harm" has been replaced by "injury or damage to the health of people, or damage to property or the environment" in the definition.]

3.1.12
greenhouse gas
GHG
gaseous constituent of the atmosphere, both natural and *anthropogenic* (3.1.36), that absorbs and emits radiation at specific wavelengths within the spectrum of infrared radiation emitted by the Earth's surface, the atmosphere, and clouds

[SOURCE: ISO 14064-1:2018, 3.1.1, modified — The Notes to entry have been removed.]

3.1.13
greenhouse gas emission
GHG emission
release of a *GHG* (3.1.12) into the atmosphere

[SOURCE: ISO 14064-1:2018, 3.1.5]

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3.1.14
greenhouse gas removal
GHG removal
withdrawal of a *GHG* (3.1.12) from the atmosphere

[SOURCE: ISO 14064-1:2018, 3.1.6, modified — The words “by GHG sinks” have been removed from the definition.]

3.1.15
greenhouse gas source
GHG source
process (3.1.35) that releases a *GHG* (3.1.12) into the atmosphere

[SOURCE: ISO 14064-1:2018, 3.1.2]

3.1.16
greenhouse gas sink
GHG sink
process (3.1.35) that removes a *GHG* (3.1.12) from the atmosphere

[SOURCE: ISO 14064-1:2018, 3.1.3]

3.1.17
carbon dioxide capture and storage
carbon capture and storage
CCS
process (3.1.35) consisting of the separation of CO_2 from industrial and energy-related sources, transportation and injection into a geological formation, resulting in long-term isolation from the atmosphere

Note 1 to entry: CCS is often referred to as carbon capture and storage. This terminology is not encouraged because it is inaccurate: the objective is the capture of carbon dioxide and not the capture of carbon. Tree plantation is another form of carbon capture that does not describe precisely the physical process of removing CO_2 from industrial emission sources.

Note 2 to entry: The term "sequestration" is also used alternatively to "storage". The term "storage" is preferred since “sequestration” is more generic and can also refer to biological processes (absorption of carbon by living organisms).

Note 3 to entry: Long-term means the minimum period necessary for geological storage of CO_2 to be considered an effective and environmentally safe *climate change mitigation* (3.1.4) option.

[SOURCE: ISO 27917:2017, 3.1.1, modified — The admitted term “carbon capture and storage” has been added, and Notes 4 and 5 to entry have been removed]

3.1.18
carbon dioxide capture and utilization
CCU
process (3.1.35) of separating (capturing) CO_2 from an industrial or manufacturing process or from air, and converting it for use as material feedstock within another *product system* (3.1.30)

Note 1 to entry: CCU is sometimes referred to as CO_2 transformation, CO_2 conversion, CO_2 recycling or CO_2 upcycling.

Note 2 to entry: Currently, the CO_2 that is captured is typically converted for use in creating fuels, chemicals, or material feedstock or used directly for enhancing plant growth in horticulture.

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3.1.19
greenhouse gas inventory
GHG inventory
list of *GHG sources* (3.1.15) and *GHG sinks* (3.1.16), and their quantified *GHG emissions* (3.1.13) and *GHG removals* (3.1.14)

[SOURCE: ISO 14064-1:2018, 3.2.6]

3.1.20
greenhouse gas programme
GHG programme
voluntary or mandatory international, national, or subnational system or scheme that registers, accounts or manages *GHG emissions* (3.1.13), *GHG removals* (3.1.14), *GHG emission reductions* (3.1.22) or *GHG removal enhancements* (3.1.23) outside the *organization* (3.1.40) or *GHG project* (3.1.21)

[SOURCE: ISO 14064-1:2018, 3.2.8]

3.1.21
greenhouse gas project
GHG project
activity or activities that alter the conditions of a *GHG baseline* (3.1.24) and which cause *GHG emission reductions* (3.1.22) or *GHG removal enhancements* (3.1.23)

[SOURCE: ISO 14064-1:2018, 3.2.7, modified — Note to entry has been removed.]

3.1.22
greenhouse gas emission reduction
GHG emission reduction
quantified decrease in *GHG emissions* (3.1.13) between a *baseline scenario* (3.1.25) and the *GHG project* (3.1.21)

[SOURCE: ISO 14064-2:2019, 3.1.7]

3.1.23
greenhouse gas removal enhancement
GHG removal enhancement
quantified increase in *GHG removals* (3.1.14) between a *baseline scenario* (3.1.25) and the *GHG project* (3.1.21)

[SOURCE: ISO 14064-2:2019, 3.1.8]

3.1.24
greenhouse gas baseline
GHG baseline
quantitative reference(s) of *GHG emissions* (3.1.13) and/or *GHG removals* (3.1.14) that would have occurred in the absence of a *GHG project* (3.1.21) and provides the *baseline scenario* (3.1.25) for comparison with project GHG emissions and/or GHG removals

[SOURCE: ISO 14064-2:2019, 3.2.5]

3.1.25
baseline scenario
hypothetical reference case that best represents the conditions most likely to occur in the absence of a proposed *GHG project* (3.1.21)

[SOURCE: ISO 14064-2:2019, 3.2.6]

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3.1.26
life cycle
consecutive and interlinked stages related to a *product* (3.1.29), from raw material acquisition or generation from natural resources to end-of-life treatment.

[SOURCE: ISO 14067:2018, 3.1.4.2, modified — Notes to entry have been removed.]

3.1.27
life cycle assessment
compilation and evaluation of the inputs, outputs and the potential environmental impacts of a *product system* (3.1.30) throughout its *life cycle* (3.1.26)

[SOURCE: ISO 14040:2006, 3.2]

3.1.28
life cycle inventory analysis
LCI
phase of *life cycle assessment* (3.1.27) involving the compilation and quantification of inputs and outputs for a *product* (3.1.29) throughout its *life cycle* (3.1.26)

[SOURCE: ISO 14040:2006, 3.3]

3.1.29
product
goods or service

[SOURCE: ISO 14067:2018, 3.1.3.1, modified — Notes to entry have been removed.]

3.1.30
product system
collection of *unit processes* (3.1.31) with elementary flows and product flows, performing one or more defined functions and which models the *life cycle* (3.1.26) of a *product* (3.1.29)

[SOURCE: ISO 14067:2018, 3.1.3.2, modified — Note to entry has been removed.]

3.1.31
unit process
smallest element considered in the *life cycle inventory analysis* (3.1.28) for which input and output data are quantified

[SOURCE: ISO 14040:2006, 3.34]

3.1.32
carbon footprint of a product
CFP
sum of *GHG emissions* (3.1.13) and *GHG removals* (3.1.14) in a *product system* (3.1.30), expressed as *CO2 equivalents* (3.1.34) and based on a *life cycle assessment* (3.1.27) using the single impact category of *climate change* (3.1.2)

[SOURCE: ISO 14067:2018, 3.1.1.1, modified — Notes to entry have been removed,]

3.1.33
partial carbon footprint of a product
partial CFP
sum of *GHG emissions* (3.1.13) and *GHG removals* (3.1.14) of one or more selected *process(es)* (3.1.35) in a *product system* (3.1.30), expressed as *CO2 equivalents* (3.1.34) and based on the selected stages or processes within the *life cycle* (3.1.26)

[SOURCE: ISO 14067:2018, 3.1.1.2, modified — Notes to entry have been removed.]

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3.1.34
CO_2 equivalent
carbon dioxide equivalent
unit for comparing the radiative forcing of a *GHG* (3.1.12) to that of carbon dioxide

[SOURCE: ISO 14067:2018, 3.1.2.2, modified — The third preferred term and Notes to entry have been removed.]

3.1.35
process
set of interrelated or interacting activities that transforms inputs into outputs

[SOURCE: ISO 14067:2018, 3.1.3.5]

3.1.36
anthropogenic
resulting from or caused by human activity

3.1.37
land use
human use or management of land within the relevant boundary

Note 1 to entry: Typically, the relevant boundary is the *product system* (3.1.30) under study.

[SOURCE: ISO 14067:2018, 3.1.7.4, modified — The abbreviated term "LU" has been removed and the original Notes to entry have been replaced with the new Note to entry.]

3.1.38
standards developer
individual or group taking part in the development of a standard

[SOURCE: ISO Guide 82:2019, 3.5]

3.1.39
interested party
stakeholder
person or *organization* (3.1.40) that can affect, be affected by, or perceive itself to be affected by a decision or activity

EXAMPLE Customers, communities, suppliers, regulators, non-governmental organizations, investors and employees.

[SOURCE: ISO 14001:2015, 3.1.6, modified — The additional preferred term "stakeholder" has been added, and Note 1 to entry has been deleted.]

3.1.40
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]

3.1.41
risk source
element which alone or in combination has the potential to give rise to *risk* (3.1.7)

[SOURCE: ISO 31000:2018, 3.4]

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3.1.42
event
occurrence or change of a particular set of circumstances

[SOURCE: ISO 31000:2018, 3.5, modified — Notes to entry have been removed.]

3.1.43
consequence
outcome of an *event* (3.1.42) affecting objectives

[SOURCE: ISO 31000:2018, 3.6, modified — Notes to entry have been removed.]

3.1.44
likelihood
chance of something happening

[SOURCE: ISO 31000:2018, 3.7, modified — Notes to entry have been removed.]

3.2 Abbreviated terms

ACC	Adaptation to Climate Change
CC	Climate Change
CCM	Climate Change Mitigation
CCS	Carbon Dioxide Capture and Storage
CCU	Carbon Dioxide Capture and Utilization
CFP	Carbon Footprint of a Product
GHG	Greenhouse Gas
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
MSS	Management System Standard
TAP	Technology, Activity or Product
UNFCCC	United Nations Framework Convention on Climate Change

4 Understanding and responding to climate change

4.1 What is climate change?

Climate change is defined as the change in the state of the climate that can be identified by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer. It is leading to a large-scale, long-term shift in the planet's weather patterns and average temperatures. Both natural processes and human activity can cause climate change.

Human activities over the past two centuries have significantly increased the amount of greenhouse gases in the atmosphere, mainly (but not exclusively) in the form of carbon dioxide, both by modifying the ability of ecosystems to extract carbon dioxide from the atmosphere and by emitting it directly, e.g. by burning fossil fuels and manufacturing goods with a high carbon intensity such as concrete. The atmosphere and oceans have warmed, accompanied by sea level rise, a strong decline in Arctic sea ice, and other climate-related changes. From 1880 to 2012, the global average surface temperature has increased by about 0,85 °C (1,4 °F) according to the IPCC Fifth Assessment Report[33]. Much of this

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