BS ISO 14068-1:2023

BSI Standards Publication

Climate change management — Transition to net zero

Part 1: Carbon neutrality

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National foreword

This British Standard is the UK implementation of ISO 14068-1:2023. It supersedes PAS 2060:2014, which will be withdrawn on 31 December 2025.

The UK participation in its preparation was entrusted to Technical Committee SES/1/7, Greenhouse gas management and related activities.

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

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INTERNATIONAL STANDARD

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First edition
2023-11

Climate change management — Transition to net zero —

Part 1: Carbon neutrality

Gestion du changement climatique — Transition vers le zéro émission nette —

Partie 1: Neutralité carbone

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Contents

Page

Foreword ... **v**

Introduction ... **vi**

1 Scope ... **1**

2 Normative references ... **1**

3 Terms, definitions and abbreviated terms ... **1**
3.1 Terms related to carbon neutrality ... 2
3.2 Terms related to greenhouse gases ... 3
3.3 Terms related to offsetting and carbon credits ... 5
3.4 Terms related to the entity seeking carbon neutrality ... 6
3.5 Abbreviated terms ... 8

4 Principles ... **8**
4.1 General ... 8
4.2 Transparency ... 9
4.3 Conservativeness ... 9
4.4 Hierarchy approach ... 9
4.5 Supporting transition ... 9
4.6 Ambition ... 9
4.7 Urgency ... 9
4.8 Science-based approach ... 9
4.9 Avoiding adverse impacts ... 9
4.10 Accountability ... 10
4.11 Value chain and life cycle approach ... 10

5 Approach ... **10**
5.1 Framework ... 10
5.2 Carbon neutrality management hierarchy ... 11
5.3 Carbon neutrality pathway ... 11
5.4 Documented information ... 12

6 Commitment to carbon neutrality ... **12**

7 Selection of the subject and its boundary ... **13**
7.1 General ... 13
7.2 Documented information ... 14

8 Quantification of greenhouse gas (GHG) emissions and GHG removals ... **14**
8.1 Quantification ... 14
8.2 Documented information ... 14

9 Carbon neutrality management plan ... **15**
9.1 Content of carbon neutrality management plan ... 15
9.2 Ambition ... 15
9.3 Evaluation and revision of the carbon neutrality management plan ... 16
9.4 Documented information ... 16

10 Greenhouse gas (GHG) emission reductions and GHG removal enhancements ... **16**
10.1 Greenhouse gas (GHG) emission reductions ... 16
10.2 Greenhouse gas (GHG) removal enhancements ... 17
10.3 Documented information ... 17

11 Offsetting the carbon footprint ... **18**
11.1 General ... 18
11.2 Criteria for carbon credits ... 18
11.3 Criteria for carbon crediting programmes ... 19
11.4 Documented information ... 20

12 Carbon neutrality report ... **20**

AVA Documents
Document Sharing Hub

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Full document details: BS ISO 14068-1:2023

13 Carbon neutrality claims **21**
Annex A (informative) **Carbon neutrality pathway** **23**
Annex B (normative) **Additional requirements for specific cases** **25**
Annex C (informative) **Comparison between International Standards on quantification and GHG Protocol Accounting and Reporting Standards** **30**
Annex D (informative) **Ambition** **41**
Bibliography **43**

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Document Sharing Hub
Full document details: BS ISO 14068-1:2023

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).

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This document was prepared by Technical Committee ISO/TC 207, *Environmental management*, Subcommittee SC 7, *Greenhouse gas and climate change management and related activities*.

A list of all parts in the ISO 14068 series can be found on the ISO website.

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

0.1 Climate change and the ISO 14060 family of standards

Climate change arising from anthropogenic activity has been identified as one of the greatest challenges facing the world and will continue to affect businesses and citizens over future decades.

Climate change has implications for both human and natural systems and can lead to significant impacts on resource availability, economic activity, biodiversity and human well-being. In response, international, regional, national and local initiatives are being developed and implemented by public and private sectors to mitigate climate change by reducing greenhouse gases (GHGs) in the Earth's atmosphere as well as to facilitate adaptation to climate change.

There is a need for effective and transformative responses to the urgent threat of climate change on the basis of the best available scientific knowledge. ISO develops documents that support the transformation of scientific knowledge into tools that will help address climate change.

Climate change mitigation initiatives rely on the quantification, monitoring, reporting, validation and verification of GHG emissions and removals.

The ISO 14060 family of standards benefits organizations, GHG project proponents and stakeholders worldwide by providing clarity and consistency for quantifying, monitoring, reporting, validating and verifying GHG emissions and removals and carbon neutrality. Specifically, the use of the ISO 14060 family of standards:

— enhances the credibility and transparency of GHG quantification, monitoring, reporting, validation and verification;

— facilitates the development and implementation of GHG management strategies and plans;

— facilitates the development and implementation of mitigation actions that provide GHG emission reductions or GHG removal enhancements;

— facilitates the ability to track performance and progress in the reduction of either GHG emissions or the increase in GHG removals, or both;

— supports sustainable development and the actions needed to achieve a low-carbon economy.

Applications of the ISO 14060 family of standards include:

— corporate decisions, such as identifying GHG emission reduction opportunities and increasing profitability by reducing energy consumption;

— risk management, such as the identification and management of climate risks and opportunities;

— voluntary initiatives, such as participation in voluntary GHG programmes or sustainability reporting initiatives;

— GHG markets, such as the buying and selling of GHG allowances or credits;

— regulatory/government GHG programmes, such as credit for early action, agreements or national and local reporting initiatives.

The following summarizes each of the documents in the ISO 14060 family of standards:

— ISO 14064-1 details principles and requirements for designing, developing, managing and reporting organization-level GHG inventories. It includes requirements for determining GHG emission and removal boundaries, quantifying an organization's GHG emissions and removals, and identifying specific organizational actions or activities aimed at improving GHG management. It also includes requirements and guidance on inventory quality management, reporting, internal auditing and the organization's responsibilities in verification activities.

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— ISO 14064-2 details principles and requirements for determining baseline scenarios and for the monitoring, quantifying and reporting of project emissions and removals. It focuses on GHG projects or project-based activities specifically designed to reduce either GHG emissions or enhance GHG removals, or both. It provides the basis for GHG projects to be validated and verified.

— ISO 14064-3 details requirements for verifying GHG statements related to GHG inventories, GHG projects and carbon footprints of products. It describes the process for validation or verification, including validation or verification planning, assessment procedures, and the evaluation of organizational, project and product GHG statements.

— ISO 14065 defines requirements for bodies that validate and verify GHG statements. Its requirements cover impartiality, competence, communication, validation and verification processes, appeals, complaints, and the management system of validation and verification bodies. It can be used as a basis for accreditation and other forms of recognition in relation to the impartiality, competence, and consistency of validation and verification bodies.

— ISO 14066 specifies competence requirements for validation teams and verification teams. It includes principles and specifies competence requirements based on the tasks that validation teams or verification teams must be able to perform.

— ISO 14067 defines the principles, requirements and guidelines for the quantification of the carbon footprint of products (e.g. goods or services, including buildings and events). It describes the process to quantify GHG emissions associated with the life cycle stages of a product, beginning with resource extraction and raw material sourcing and extending through the production, use and end-of-life stages of the product.

— ISO/TS 14064-4[1)] assists users in the application of ISO 14064-1, providing guidelines and examples for improving transparency in the quantification of emissions and their reporting.

0.2 ISO 14068-1 (this document) — Carbon neutrality

This document is designed to build upon existing International Standards addressing GHG quantification, reporting, validation and verification, such as ISO 14064-1, ISO 14064-3 and ISO 14067. Figure 1 illustrates the relationship with documents within the ISO 14060 family of GHG standards as well as some related International Standards on environmental labels and declarations.

1) Under preparation. Stage at the time of publication: ISO/CD TS 14064-4:2023.

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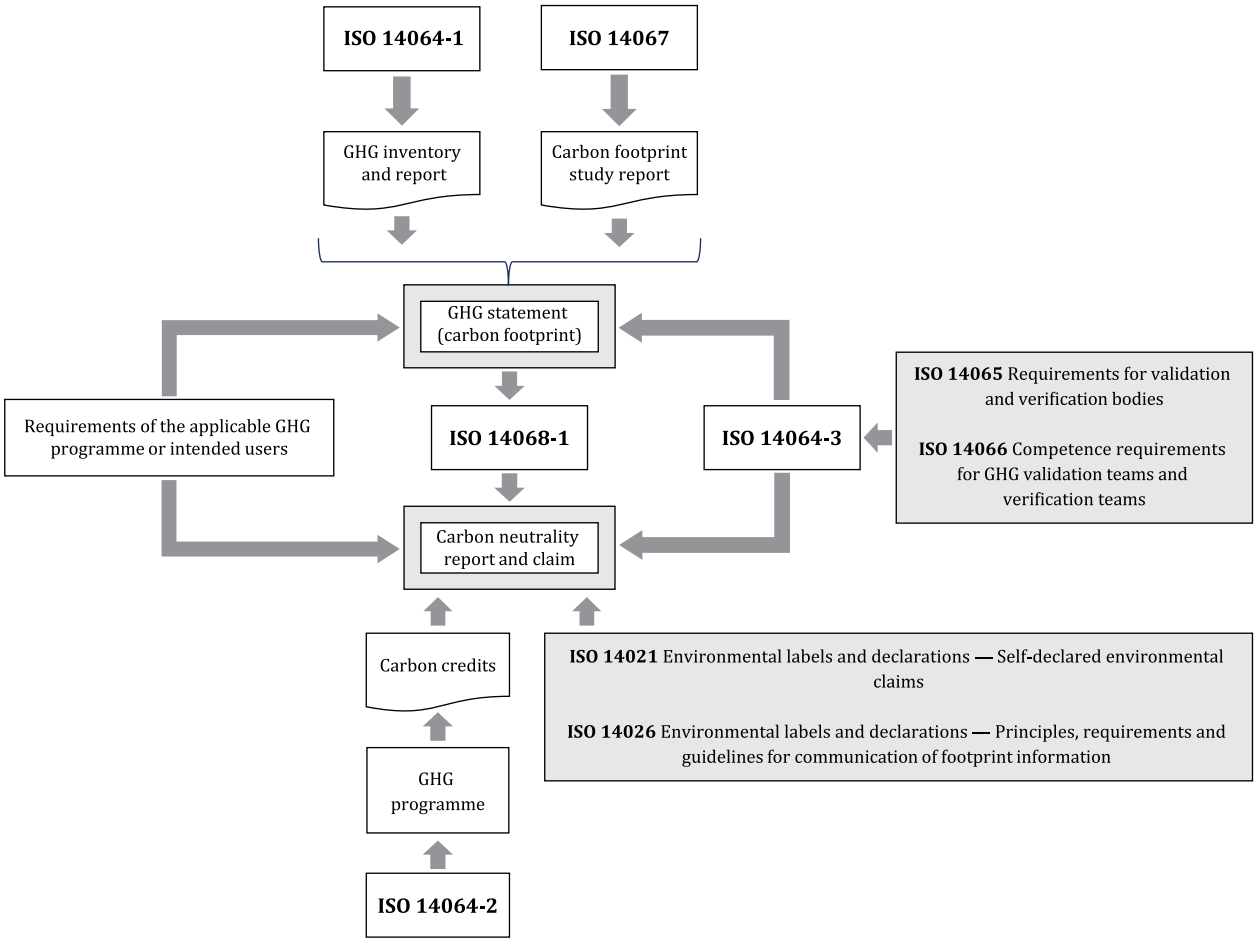

Figure 1 — ISO 14068-1 (this document) in relation to other International Standards

This document provides a standardized approach to achieving and demonstrating carbon neutrality. It is applicable to subjects, i.e. organizations and products (e.g. goods and services, including events and buildings).

The hierarchy approach presented in this document prioritizes actions to reduce the direct and indirect GHG emissions and enhance GHG removals of the subject, with offsetting used only for the carbon footprint remaining after these actions.

Avoided GHG emissions, for example by the use of goods or services, are not addressed in this document but they also have a role to play in the strategy of organizations to support the global objective of carbon neutrality. Avoided GHG emissions reflect the efforts of organizations to provide low-carbon products or solutions.

The quantification, monitoring and reporting related to GHG projects undertaken with the primary purpose of creating GHG emission reductions or GHG removal enhancements are also outside the scope of this document.

Achievement of carbon neutrality by organizations and products entails actions that reduce GHG emissions and enhance GHG removals, and thus can help support countries to fulfil their nationally determined contributions (NDCs) and to meet the goals of the Paris Agreement.[14]

0.3 Carbon neutrality and net zero GHG emissions

Carbon neutrality (as defined in this document) and net zero GHG emissions are related concepts. At a global scale, these terms are defined by the Intergovernmental Panel on Climate Change (IPCC)[2)] as

2) The IPCC is the United Nations body for assessing the science related to climate change. https://www.ipcc.ch/

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being equivalent, both referring to the condition in which anthropogenic GHG emissions are balanced by anthropogenic GHG removals over a specified period. In this document, this condition is referred to as “global net zero GHG emissions”.

At sub-global scale, carbon neutrality is generally used for organizations and products, and achieving carbon neutrality commonly involves offsetting to counterbalance the carbon footprint of the subject. In this document, carbon neutrality is considered as a pathway of continual improvement along which the carbon footprint of the subject is reduced by implementing emissions reduction and removal enhancement activities, and therefore the need for offsetting decreases over time.

At sub-global scale, net zero GHG emissions is generally applied to territories (e.g. a country, a municipality) and to organizations, but not to products. Net zero GHG emissions is defined and assessed differently in different contexts. For organizations, net zero GHG emissions is commonly considered as the condition in which emissions have been reduced such that only residual emissions remain, and offsetting is restricted to removal credits only.

With respect to territories, assessment of net zero GHG emissions considers the emissions and removals under direct control or jurisdiction of the territory, and offsetting is sometimes excluded.

This document does not address requirements or recommendations for net zero GHG emissions at either the global or a sub-global scale.

0.4 General

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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Climate change management — Transition to net zero —

Part 1: Carbon neutrality

1 Scope

This document specifies principles, requirements and guidance for achieving and demonstrating carbon neutrality through the quantification, reduction and offsetting of the carbon footprint.

This document defines terms used in relation to carbon neutrality and provides guidance on the actions necessary to achieve and demonstrate carbon neutrality. In accordance with common practice, it uses the word "carbon" to refer to all greenhouse gases (GHGs) in compound expressions such as "carbon neutrality".

It is applicable to a wide range of subjects such as organizations (including companies, local authorities and financial institutions) and products (goods or services, including buildings and events). It is not intended to be used for territories (such as regions, countries, states or cities), including signatories to the United Nations Framework Convention on Climate Change (UNFCCC) when reporting national outcomes for the purposes of that Convention.

This document establishes a hierarchy for carbon neutrality where GHG emission reductions (direct and indirect) and GHG removal enhancements within the value chain take priority over offsetting. It includes requirements for carbon neutrality commitments and making carbon neutrality claims.

This document is GHG programme neutral. If a GHG programme is applicable, the requirements of that GHG programme are additional to the requirements of this document.

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 14064-1, *Greenhouse gases — Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals*

ISO 14064-3, *Greenhouse gases — Part 3: Specification with guidance for the verification and validation of greenhouse gas statements*

ISO 14067, *Greenhouse gases — Carbon footprint of products — Requirements and guidelines for quantification*

3 Terms, definitions and abbreviated terms

For the purposes of this document, the terms and definitions given in ISO 14064-1, ISO 14067 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/

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3.1 Terms related to carbon neutrality

3.1.1
carbon neutral
condition in which, during a specified period of time, the *carbon footprint* (3.2.4) has been reduced as a result of *greenhouse gas (GHG) emission reductions* (3.2.3) or *GHG removal enhancements* (3.2.8) and, if greater than zero, is then counterbalanced by *offsetting* (3.3.1)

Note 1 to entry: *Carbon credits* (3.3.2) used for offsetting shall meet certain criteria (see Clause 11) and are only used after GHG emission reductions and GHG removal enhancements have been made in line with the carbon neutrality management plan.

Note 2 to entry: The specified period of time is a finite number of years, for *organizations* (3.4.3), or the full or partial life cycle, for *products* (3.4.4).

3.1.2
carbon neutrality
state of being *carbon neutral* (3.1.1)

Note 1 to entry: The Intergovernmental Panel on Climate Change (IPCC) distinguishes between carbon neutrality, a condition in which CO_2 emissions are balanced by CO_2 removals, and greenhouse gas (GHG) neutrality, in which all *GHG emissions* (3.2.2) are balanced by *GHG removals* (3.2.7). The definition of carbon neutrality in this document is equivalent to the IPCC definition of GHG neutrality.

3.1.3
carbon neutrality claim
public declaration made by an *entity* (3.4.1) regarding the *carbon neutrality* (3.1.2) of the *subject* (3.4.2)

3.1.4
unabated greenhouse gas emission
unabated GHG emission
GHG emission (3.2.2) of the *subject* (3.4.2) remaining after activities resulting in *GHG emission reductions* (3.2.3) within the *boundary* (3.2.16, 3.2.17) of the subject

Note 1 to entry: Additional information on unabated and *residual GHG emissions* (3.1.5) can be found in Annex A.

Note 2 to entry: Unabated GHG emissions include, but are not limited to, residual GHG emissions.

3.1.5
residual greenhouse gas emission
residual GHG emission
unabated GHG emission (3.1.4) remaining after implementing all technically and economically feasible *GHG emission reductions* (3.2.3)

Note 1 to entry: Additional information on unabated and residual GHG emissions can be found in Annex A.

3.1.6
reporting period
specific historical period selected for the determination of *carbon neutrality* (3.1.2)

Note 1 to entry: The reporting period is specified in the carbon neutrality management plan of the *entity* (3.4.1) and is typically a year, but can be shorter, e.g. in relation to an event that recurs every six months, or longer, such as for agricultural or forest systems, which can involve multi-year management.

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3.2 Terms related to greenhouse gases

3.2.1
greenhouse gas
GHG
gaseous constituent of the atmosphere, both natural and anthropogenic, that absorbs and emits radiation at specific wavelengths within the spectrum of infrared radiation emitted by the Earth's surface, the atmosphere and clouds

Note 1 to entry: For a list of GHGs, see the latest Intergovernmental Panel on Climate Change (IPCC) Assessment Report.

Note 2 to entry: The most common anthropogenic GHGs are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), nitrogen trifluoride (NF_3), perfluorocarbons (PFCs) and sulfur hexafluoride (SF_6). Emissions from these gases are reported as *carbon dioxide equivalents* (3.2.12) using *global warming potentials* (3.2.11).

[SOURCE: ISO 14064-1:2018, 3.1.1, modified — Note 2 to entry added.]

3.2.2
greenhouse gas emission
GHG emission
release of a *GHG* (3.2.1) into the atmosphere

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

3.2.3
greenhouse gas emission reduction
GHG emission reduction
decrease in *GHG emissions* (3.2.2) quantified between two points in time or relative to a *baseline* (3.2.13)

Note 1 to entry: Adapted from ISO 14064-2:2019, 3.1.7.

3.2.4
carbon footprint
sum of *greenhouse gas (GHG) emissions* (3.2.2) and *GHG removals* (3.2.7) of the *subject* (3.4.2) expressed as *carbon dioxide equivalents* (3.2.12)

Note 1 to entry: For a *product* (3.4.4), the carbon footprint is based on a life cycle assessment using the single impact category of climate change in accordance with ISO 14067.

Note 2 to entry: For an *organization* (3.4.3), the carbon footprint is equivalent to the sum of the *direct GHG emissions* (3.2.5), *indirect GHG emissions* (3.2.6) and GHG removals, if applicable, within the *boundary* (3.2.16) of the subject quantified in accordance with ISO 14064-1.

3.2.5
direct greenhouse gas emission
direct GHG emission
GHG emission (3.2.2) within the *boundary* (3.2.16, 3.2.17) of the *subject* (3.4.2), from *GHG sources* (3.2.9) owned or controlled by the *entity* (3.4.1)

[SOURCE: ISO 14064-1:2018, 3.1.9, modified — "within the boundary of the subject" added and "entity" replaced "organization". Note 1 to entry deleted.]

3.2.6
indirect greenhouse gas emission
indirect GHG emission
GHG emission (3.2.2) that is a consequence of, and within the *boundary* (3.2.16, 3.2.17) of, the *subject* (3.4.2), but that arises from *GHG sources* (3.2.9) that are not owned or controlled by the *entity* (3.4.1)

Note 1 to entry: These emissions occur generally in the upstream and/or downstream *value chain* (3.4.7) of the subject.

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[SOURCE: ISO 14064-1:2018, 3.1.11, modified — "and within the boundary of, the subject" replaced "an organization's operations and activities" and "entity" replaced "organization" in the definition. "value chain of the subject" replaced "chain" in Note 1 to entry.]

3.2.7
greenhouse gas removal
GHG removal
withdrawal of a *GHG* (3.2.1) from the atmosphere by a *GHG sink* (3.2.10)

Note 1 to entry: Examples of ways in which GHG removals can be achieved include reforestation, carbon sequestration in soils, sustainable bioenergy with carbon capture and storage, and direct air carbon capture and storage.

[SOURCE: ISO 14064-1:2018, 3.1.6, modified — "GHG sink" made singular. Note 1 to entry added.]

3.2.8
greenhouse gas removal enhancement
GHG removal enhancement
quantified increase in *GHG removals* (3.2.7) between two points in time or relative to a *baseline* (3.2.13)

Note 1 to entry: Adapted from ISO 14064-2:2019, 3.1.8.

3.2.9
greenhouse gas source
GHG source
process that releases a *GHG* (3.2.1) into the atmosphere

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

3.2.10
greenhouse gas sink
GHG sink
process that removes a *GHG* (3.2.1) from the atmosphere

Note 1 to entry: A process can be natural or anthropogenic.

[SOURCE: ISO 14064-1:2018, 3.1.3, modified — Note 1 to entry added.]

3.2.11
global warming potential
GWP
index, based on radiative properties of *greenhouse gases (GHGs)* (3.2.1), measuring the radiative forcing following a pulse emission of a unit mass of a given GHG in the present-day atmosphere integrated over a chosen time horizon, relative to that of carbon dioxide (CO_2)

Note 1 to entry: The Intergovernmental Panel on Climate Change (IPCC) publishes and regularly updates GWP values for various time horizons, including 20, 100 and 500 years.

[SOURCE: ISO 14064-1:2018, 3.1.12, modified — Note 1 to entry added.]

3.2.12
carbon dioxide equivalent
CO_2e
unit for expressing the radiative forcing of a *greenhouse gas (GHG)* (3.2.1) in relation to that of carbon dioxide

Note 1 to entry: The carbon dioxide equivalent is calculated by multiplying the mass of a given GHG by its *global warming potential* (3.2.11).

[SOURCE: ISO 14064-1:2018, 3.1.13, modified — "expressing" replaced "comparing" and "in relation to" added in the definition. Note 1 to entry clarified.]

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3.2.13
baseline
quantified *greenhouse gas (GHG) emissions* (3.2.2) and/or *GHG removals* (3.2.7) of a *subject* (3.4.2) for a *base period* (3.2.14)

Note 1 to entry: The baseline is used when quantifying changes in the *carbon footprint* (3.2.4) over time and towards targets in the carbon neutrality management plan.

Note 2 to entry: In a case where the base period cannot be determined, e.g. for a one-off event, the baseline can be estimated on the basis of a reference situation that best represents the conditions most likely to occur in the absence of *climate change mitigation* (3.2.15) activities.

3.2.14
base period
specific, historical period identified for the purpose of comparing *greenhouse gas (GHG) emissions* (3.2.2) or *GHG removals* (3.2.7) or other GHG-related information over time

[SOURCE: ISO 14064-1:2018, 3.2.10, modified — "period" replaced "year" in the term.]

3.2.15
climate change mitigation
human intervention to reduce *greenhouse gas (GHG) emissions* (3.2.2) or enhance *GHG removals* (3.2.7)

[SOURCE: ISO Guide 84:2020, 3.1.4, modified — Admitted term "mitigation" deleted.]

3.2.16
boundary
<organization> grouping of *greenhouse gas (GHG) emissions* (3.2.2) or *GHG removals* (3.2.7) reported from within the organizational boundary as well as those significant *indirect GHG emissions* (3.2.6) that are a consequence of the *organization's* (3.4.3) operations and activities

Note 1 to entry: "Organizational boundary" and "significant indirect GHG emissions" are defined in ISO 14064-1.

Note 2 to entry: In this document, the term "boundary" is equivalent to "reporting boundary" in ISO 14064-1.

[SOURCE: ISO 14064-1:2018, 3.4.8 modified — "reporting" removed from the term. Domain <organization> added. Notes 1 and 2 to entry added.]

3.2.17
boundary
system boundary
<product> set of criteria representing which unit processes are a part of the product system under study

Note 1 to entry: "Unit process" and "product system" are defined in ISO 14067.

Note 2 to entry: In this document, the term "boundary" is equivalent to "system boundary" in ISO 14067.

[SOURCE: ISO 14067:2018, 3.1.3.4, modified — Reference to "boundary based on" removed. "product system" replaced "system". Notes 1 and 2 to entry added.]

3.3 Terms related to offsetting and carbon credits

3.3.1
offsetting
counterbalancing of the *carbon footprint* (3.2.4), by retiring a *carbon credit(s)* (3.3.2)

Note 1 to entry: The final step in the process of offsetting is to retire the carbon credits in a *public registry* (3.3.5) by, or on behalf of, the *entity* (3.4.1). Some registries use "to cancel" as synonymous with "to retire" and the terms are effectively interchangeable. The two terms "retire" and "cancel" result in the same outcome of ensuring that the carbon credits cannot be used again or be further traded.

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3.3.2
carbon credit
greenhouse gas credit
GHG credit
tradeable certificate representing one tonne of *carbon dioxide equivalent* (3.2.12) from *GHG emission reductions* (3.2.3) or *GHG removal enhancements* (3.2.8)

Note 1 to entry: An *entity* (3.4.1) can retire a carbon credit without using it for *offsetting* (3.3.1).

Note 2 to entry: Carbon credits can be of different types: avoidance credits, reduction credits or removal credits.

Note 3 to entry: Carbon credits used for *carbon neutrality claims* (3.1.3) are generated outside the *boundary* (3.2.16, 3.2.17) of the *subject* (3.4.2).

3.3.3
greenhouse gas programme
GHG programme
voluntary or mandatory international, national or subnational system or scheme that registers, accounts or manages *GHG emissions* (3.2.2), *GHG removals* (3.2.7), *GHG emission reductions* (3.2.3) or *GHG removal enhancements* (3.2.8)

[SOURCE: ISO 14064-1:2018, 3.2.8, modified — "outside the organization or GHG project" removed.]

3.3.4
carbon crediting programme
greenhouse gas (GHG) programme (3.3.3) that issues *carbon credits* (3.3.2)

Note 1 to entry: The carbon credits shall conform to the criteria established by the programme as well as the requirements of this document (see Clause 11).

3.3.5
public registry
information system that makes available to *stakeholders* (3.4.5) details of *carbon credits* (3.3.2) issued

Note 1 to entry: A public registry includes the serial numbers, ownership and retirement status of carbon credits.

Note 2 to entry: A public registry can be maintained by a *carbon crediting programme* (3.3.4) or by a third party.

3.4 Terms related to the entity seeking carbon neutrality

3.4.1
entity
organization (3.4.3) that is seeking to achieve and demonstrate *carbon neutrality* (3.1.2) for the *subject* (3.4.2)

Note 1 to entry: The entity and the subject can be identical, e.g. a company that is seeking carbon neutrality for all its operations.

Note 2 to entry: There can be *greenhouse gas (GHG) emissions* (3.2.2) associated with the subject from *GHG sources* (3.2.9) that are not under the operational or financial control of the entity.

Note 3 to entry: An entity may be responsible for several subjects, such as where a company is seeking carbon neutrality for different *products* (3.4.4) that it manufactures.

Note 4 to entry: In this document, the term "entity" is equivalent to "responsible party" in ISO 14064-1:2018: 3.4.3, and "organization" in ISO 14067:2018, 3.1.5.1.

3.4.2
subject
organization (3.4.3) or *product* (3.4.4)

Note 1 to entry: The *entity* (3.4.1) is committed to reduce the *carbon footprint* (3.2.4) of the subject as part of the carbon neutrality management plan.

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