INTERNATIONAL STANDARD

ISO 14064-1

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Greenhouse gases —

Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals

Gaz à effet de serre —
Partie 1: Spécifications et lignes directrices, au niveau des organismes, pour la quantification et la déclaration des émissions et des suppressions des gaz à effet de serre

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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 Technical Committee ISO/TC 207, *Environmental management*, Subcommittee SC 7, *Greenhouse gas management and related activities*.

This second edition cancels and replaces the first edition (ISO 14064-1:2006), which has been technically revised.

The main changes compared to the previous edition are as follows.

— A new approach has been introduced to reporting boundaries, facilitating the inclusion and expansion of indirect emissions. This change is a response to a growing number of organizations that are recognizing the importance and significance of indirect emissions and are developing GHG inventories that include more types of indirect emissions across the value chain.

— The GHG emissions category “other indirect GHG emissions” has been renamed “indirect GHG emissions.” Requirements and guidance have been provided for classification of indirect GHG emissions into five specific categories. “Operational boundaries” has been renamed “reporting boundaries” for clarification and simplicity.

— New requirements and guidance for GHG quantification and reporting of specific items, such as the treatment of biogenic carbon and GHG emissions related to electricity, have been added for clarification.

A list of all parts in the ISO 14064 series can be found on the ISO website.

This document is the generic standard for the quantification and reporting of greenhouse gas emission and removals at an organizational level.

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

0.1 Background

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

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

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

GHG initiatives on mitigation rely on the quantification, monitoring, reporting and verification of GHG emissions and/or removals.

The ISO 14060 family provides clarity and consistency for quantifying, monitoring, reporting and validating or verifying GHG emissions and removals to support sustainable development through a low-carbon economy and to benefit organizations, project proponents and interested parties worldwide. Specifically, the use of the ISO 14060 family:

— enhances the environmental integrity of GHG quantification;

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

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

— facilitates the development and implementation of mitigation actions through emission reductions or removal enhancements;

— facilitates the ability to track performance and progress in the reduction of GHG emissions and/or increase in GHG removals.

Applications of the ISO 14060 family include:

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

— risks and opportunities management, such as climate-related risks, including financial, regulatory, supply chain, product and customer, litigation, reputational risks and its opportunity for business (e.g. new market, new business model);

— voluntary initiatives, such as participation in voluntary GHG registries 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.

This document 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 company 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.

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

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 verification or validation, including verification or validation 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 have to be able to perform.

ISO 14067 defines the principles, requirements and guidelines for the quantification of the carbon footprint of products. The aim of ISO 14067 is 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 phases of the product.

ISO/TR 14069 assists users in the application of this document, providing guidelines and examples for improving transparency in the quantification of emissions and their reporting. It does not provide additional guidance to this document.

Figure 1 illustrates the relationship among the ISO 14060 family of GHG standards.

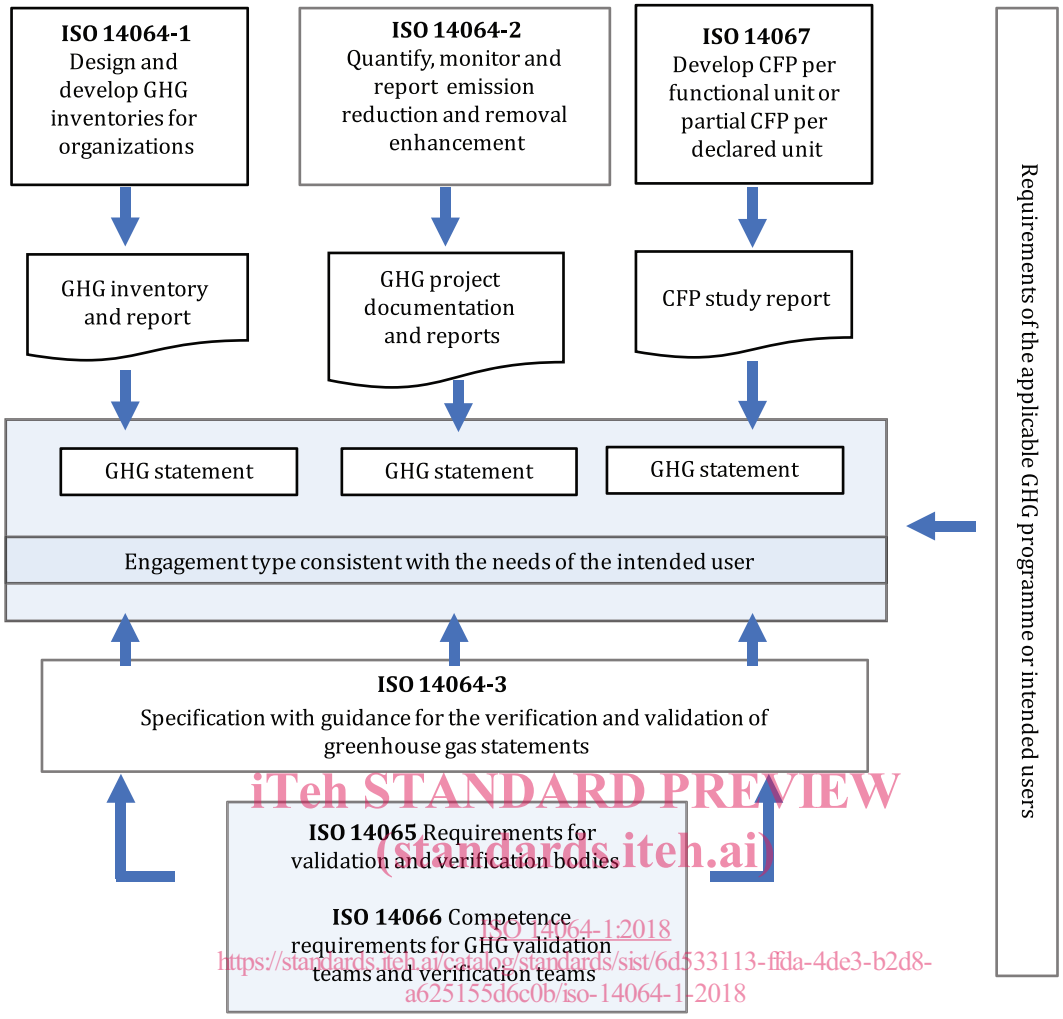

Figure 1 — Relationship among the ISO 14060 family of GHG standards

0.2 Base GHG quantification concepts used by this document

This document incorporates many key concepts developed over a number of years. References listed in the Bibliography provide (examples of) additional guidance on these concepts.

0.3 Significance of the terms "document", "explain" and "justify" in this document

Some clauses require users of this document to document, explain and justify the use of certain approaches or decisions taken.

Document involves capturing and storing the pertinent information in writing.

Explain involves two additional criteria:

a) describe how approaches were used or decisions taken, and

b) describe why approaches were chosen or decisions made.

Justify involves an additional third and fourth criteria:

c) explain why alternative approaches were not chosen, and

d) provide supporting data or analysis.

Greenhouse gases —

Part 1:
Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals

1 Scope

This document specifies principles and requirements at the organization level for the quantification and reporting of greenhouse gas (GHG) emissions and removals. It includes requirements for the design, development, management, reporting and verification of an organization's GHG inventory.

The ISO 14064 series is GHG programme neutral. If a GHG programme is applicable, requirements of that GHG programme are additional to the requirements of the ISO 14064 series.

2 Normative references

There are no normative references in this document.

3 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 Terms relating to greenhouse gases

3.1.1
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: Water vapour and ozone are anthropogenic as well as natural GHGs, but are not included as recognized GHGs due to difficulties, in most cases, in isolating the human-induced component of global warming attributable to their presence in the atmosphere.

3.1.2
greenhouse gas source
GHG source
process that releases a *GHG* (3.1.1) into the atmosphere

3.1.3
greenhouse gas sink
GHG sink
process that removes a *GHG* (3.1.1) from the atmosphere

3.1.4
greenhouse gas reservoir
GHG reservoir
component, other than the atmosphere, that has the capacity to accumulate *GHGs* (3.1.1), and to store and release them

Note 1 to entry: Oceans, soils and forests are examples of components that can act as reservoirs.

Note 2 to entry: GHG capture and storage is one of the processes that results in a GHG reservoir.

3.1.5
greenhouse gas emission
GHG emission
release of a *GHG* (3.1.1) into the atmosphere

3.1.6
greenhouse gas removal
GHG removal
withdrawal of a *GHG* (3.1.1) from the atmosphere by *GHG sinks* (3.1.3)

3.1.7
greenhouse gas emission factor
GHG emission factor
coefficient relating *GHG activity data* (3.2.1) with the *GHG emission* (3.1.5)

Note 1 to entry: A GHG emission factor could include an oxidation component.

3.1.8
greenhouse gas removal factor
GHG removal factor
coefficient relating *GHG activity data* (3.2.1) with the *GHG removal* (3.1.6)

Note 1 to entry: A GHG removal factor could include an oxidation component.

3.1.9
direct greenhouse gas emission
direct GHG emission
GHG emission (3.1.5) from *GHG sources* (3.1.2) owned or controlled by the *organization* (3.4.2)

Note 1 to entry: This document uses the concepts of equity share or control (financial or operational control) to establish organizational boundaries.

3.1.10
direct greenhouse gas removal
direct GHG removal
GHG removal (3.1.6) from *GHG sinks* (3.1.3) owned or controlled by the *organization* (3.4.2)

3.1.11
indirect greenhouse gas emission
indirect GHG emission
GHG emission (3.1.5) that is a consequence of an *organization's* (3.4.2) operations and activities, but that arises from *GHG sources* (3.1.2) that are not owned or controlled by the organization

Note 1 to entry: These emissions occur generally in the upstream and/or downstream chain.

3.1.12
global warming potential
GWP
index, based on radiative properties of *GHGs* (3.1.1), 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)

3.1.13
carbon dioxide equivalent
CO_2e
unit for comparing the radiative forcing of a *GHG* (3.1.1) to that of carbon dioxide

Note 1 to entry: The carbon dioxide equivalent is calculated using the mass of a given GHG multiplied by its *global warming potential* (3.1.12).

3.2 Terms relating to the GHG inventory process

3.2.1
greenhouse gas activity data
GHG activity data
quantitative measure of activity that results in a *GHG emission* (3.1.5) or *GHG removal* (3.1.6)

EXAMPLE Amount of energy, fuels or electricity consumed, material produced, service provided, area of land affected.

3.2.2
primary data
quantified value of a process or an activity obtained from a direct measurement or a calculation based on direct measurements

Note 1 to entry: Primary data can include *GHG emission factors* (3.1.7) *or GHG removal factors* (3.1.8) and/or *GHG activity data* (3.2.1).

3.2.3
site-specific data
primary data (3.2.2) obtained within the *organizational boundary* (3.4.7)

Note 1 to entry: All site-specific data are primary data, but not all primary data are site-specific data.

3.2.4
secondary data
data obtained from sources other than *primary data* (3.2.2)

Note 1 to entry: Such sources can include databases and published literature validated by competent authorities.

3.2.5
greenhouse gas statement
GHG statement
DEPRECATED: GHG assertion
factual and objective declaration that provides the subject matter for the *verification* (3.4.9) or *validation* (3.4.10)

Note 1 to entry: The GHG statement could be presented at a point in time or could cover a period of time.

Note 2 to entry: The GHG statement provided by the *responsible party* (3.4.3) should be clearly identifiable, capable of consistent evaluation or measurement against suitable criteria by a *verifier* (3.4.11) or *validator* (3.4.12).

Note 3 to entry: The GHG statement could be provided in a *GHG report* (3.2.9) or *GHG project* (3.2.7) plan.

3.2.6
greenhouse gas inventory
GHG inventory
list of *GHG sources* (3.1.2) and *GHG sinks* (3.1.3), and their quantified *GHG emissions* (3.1.5) and *GHG removals* (3.1.6)

3.2.7
greenhouse gas project
GHG project
activity or activities that alter the conditions of a GHG baseline and which cause *GHG emission* (3.1.5) reductions or *GHG removal* (3.1.6) enhancements

Note 1 to entry: ISO 14064-2 provides information on how to determine and use GHG baselines.

3.2.8
greenhouse gas programme
GHG programme
voluntary or mandatory international, national or subnational system or scheme that registers, accounts or manages *GHG emissions* (3.1.5), *GHG removals* (3.1.6), GHG emission reductions or GHG removal enhancements outside the *organization* (3.4.2) or *GHG project* (3.2.7)

3.2.9
greenhouse gas report
GHG report
standalone document intended to communicate an *organization's* (3.4.2) or *GHG project's* (3.2.7) GHG-related information to its *intended users* (3.4.4)

Note 1 to entry: A GHG report can include a *GHG statement* (3.2.5).

3.2.10
base year
specific, historical period identified for the purpose of comparing *GHG emissions* (3.1.5) or *GHG removals* (3.1.6) or other GHG-related information over time

3.2.11
greenhouse gas reduction initiative
GHG reduction initiative
specific activity or initiative, not organized as a *GHG project* (3.2.7), implemented by an *organization* (3.4.2) on a discrete or continuous basis, to reduce or prevent direct or indirect *GHG emissions* (3.1.5) or enhance direct or indirect *GHG removals* (3.1.6)

3.2.12
monitoring
continuous or periodic assessment of *GHG emissions* (3.1.5), *GHG removals* (3.1.6) or other GHG-related data

3.2.13
uncertainty
parameter associated with the result of quantification that characterizes the dispersion of the values that could be reasonably attributed to the quantified amount

Note 1 to entry: Uncertainty information typically specifies quantitative estimates of the likely dispersion of values and a qualitative description of the likely causes of the dispersion.

3.2.14
significant indirect greenhouse gas emission
significant indirect GHG emission
organization's (3.4.2) quantified and reported *GHG emissions* (3.1.5) complying with the significance criteria set by the organization

3.3 Terms relating to biogenic material and land use

3.3.1
biomass
material of biological origin, excluding material embedded in geological formations and material transformed to fossilized material

Note 1 to entry: Biomass includes organic material (both living and dead), e.g. trees, crops, grasses, tree litter, algae, animals, manure and waste of biological origin.

3.3.2
biogenic carbon
carbon derived from *biomass* (3.3.1)

3.3.3
biogenic CO_2
CO_2 obtained by the oxidation of *biogenic carbon* (3.3.2)

3.3.4
anthropogenic biogenic GHG emission
GHG emission (3.1.5) from biogenic material as a result of human activities

3.3.5
direct land use change
dLUC
change in the human use of land within the relevant boundary

Note 1 to entry: Relevant boundary is the *reporting boundary* (3.4.8).

3.3.6
land use
human use or management of land within the relevant boundary

Note 1 to entry: Relevant boundary is the *reporting boundary* (3.4.8).

3.3.7
non-anthropogenic biogenic GHG emission
GHG emission (3.1.5) from biogenic material caused by natural disasters (e.g. wildfire or infestation by insects) or natural evolution (e.g. growth, decomposition)

3.4 Terms relating to organizations, interested parties and verification

3.4.1
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

3.4.2
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, association, charity or institution, or part or combination thereof, whether incorporated or not, public or private.

3.4.3
responsible party
person or persons responsible for the provision of the *GHG statement* (3.2.5) and the supporting *GHG* (3.1.1) information

Note 1 to entry: The responsible party can be either individuals or representatives of an *organization* (3.4.2) or project, and can be the party who engages the *verifier* (3.4.11) or *validator* (3.4.12).

3.4.4
intended user
individual or *organization* (3.4.2) identified by those reporting GHG-related information as being the one who relies on that information to make decisions

Note 1 to entry: The intended user can be the *client* (3.4.5), the *responsible party* (3.4.3), the organization itself, *GHG programme* (3.2.8) administrators, regulators, the financial community or other affected interested parties, such as local communities, government departments, general public or non-governmental organizations.

3.4.5
client
organization (3.4.2) or person requesting *verification* (3.4.9) or *validation* (3.4.10)

3.4.6
intended use of the GHG inventory
main purpose set by the *organization* (3.4.2), or a programme, to quantify its *GHG emissions* (3.1.5) and *GHG removals* (3.1.6) consistent with the needs of the *intended user* (3.4.4)

3.4.7
organizational boundary
grouping of activities or facilities in which an *organization* (3.4.2) exercises operational or financial control or has an equity share

3.4.8
reporting boundary
grouping of *GHG emission* (3.1.5) or *GHG removals* (3.1.6) reported from within the *organizational boundary* (3.4.7), as well as those significant indirect emissions that are a consequence of the *organization's* (3.4.2) operations and activities

3.4.9
verification
process for evaluating a statement of historical data and information to determine if the statement is materially correct and conforms to criteria

3.4.10
validation
process for evaluating the reasonableness of the assumptions, limitations and methods that support a statement about the outcome of future activities

3.4.11
verifier
competent and impartial person with responsibility for performing and reporting on a *verification* (3.4.9)

3.4.12
validator
competent and impartial person with responsibility for performing and reporting on a *validation* (3.4.10)

3.4.13
level of assurance
degree of confidence in the *GHG statement* (3.2.5)

4 Principles

4.1 General

The application of principles is fundamental to ensure that GHG-related information is a true and fair account. The principles are the basis for, and will guide the application of, the requirements in this document.

4.2 Relevance

Select the GHG sources, GHG sinks, GHG reservoirs, data and methodologies appropriate to the needs of the intended user.

4.3 Completeness

Include all relevant GHG emissions and removals.

4.4 Consistency

Enable meaningful comparisons in GHG-related information.

4.5 Accuracy

Reduce bias and uncertainties as far as is practical.

4.6 Transparency

Disclose sufficient and appropriate GHG-related information to allow intended users to make decisions with reasonable confidence.

5 GHG inventory boundaries

5.1 Organizational boundaries

The organization shall define its organizational boundaries.

The organization may comprise one or more facilities. Facility-level GHG emissions or removals may be produced from one or more GHG sources or sinks.

The organization shall consolidate its facility-level GHG emissions and removals by one of the following approaches:

a) control: the organization accounts for all GHG emissions and/or removals from facilities over which it has financial or operational control;

b) equity share: the organization accounts for its portion of GHG emissions and/or removals from respective facilities.

The consolidation approach shall be consistent with the intended use of the GHG inventory.

NOTE 1 Guidance on applying control and equity share approaches to consolidate facility-level GHG emissions and removals to the organization level is included in Annex A.