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Stationary source emissions — Determination of greenhouse gas emissions in energy-intensive industries —

Part 1: General aspects

Émissions de sources fixes — Détermination des émissions des gaz à effet de serre dans les industries à forte intensité énergétique —

Partie 1: Aspects généraux

Member bodies are requested to consult relevant national interests in ISO/TC 207/SC 7 before casting their ballot to the e-Balloting application.

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

A list of all parts in the ISO 19694 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.

Introduction

This document is the first part of ISO 19694 series, which contains harmonized common methods for measuring, testing and quantifying greenhouse gas (GHG) emissions from six sector-specific industry sectors, and one document on general aspects.

In particular, the ISO 19694 series contains harmonized methods for:

a) measuring, testing and quantifying GHG emissions from sector-specific sources;

b) assessing the level of GHG emissions performance of production processes over time, at production sites;

c) establishing and providing reliable, accurate and quality information for reporting purposes.

This document is harmonized with ISO 14064-1, which contains broader requirements. This document deals with the general aspects and can serve as a basis for any specific sector standards.

The ISO 19694 series enables industry to manage the GHG emissions output of the production processes and to allow performance assessment between plants and over time. The objective is to continuously improve the reduction potential of the production processes by acting on the emission performance over time.

This document contributes to competitiveness of industry and is a tool for formalizing businesses' contributions to providing emission reductions in their operations and to developing low-carbon technology solutions to the market.

This document also addresses the following issues:

— avoidance of double-counting at plant, organization, group, national and international levels;

— distinguishing different drivers of emissions (technological improvement, internal and external growth);

— reporting of emissions in absolute as well as specific (unit-based) terms;

— ensuring that the full range of achieved direct and indirect GHG abatements are reflected.

This document also provides a flexible tool to support the needs of different monitoring and reporting purposes, such as internal management and public corporate reporting of GHG emission performance in accordance with the production processes on a production site.

The purpose of this document is not to prescribe specific requirements for verification or certification of methods, measurements, calculations or resulting data, which are given in ISO 14064-3.

Due to the nature of the issues concerned, and their wide public interest, verification and certification should be prepared for. The operator should organize files and records in such a way that they are easily retrievable and traceable. Documentation includes:

— personnel qualifications;

— methods applied;

— time series of measurements performed;

— calibration status of equipment used;

— calculations of emissions.

The ISO 19694 series should be readily available for corporate internal verification, second-party (i.e. customer) verification or third-party certification if required by interested parties.

Within this document, “measuring, testing and quantifying for GHG emissions” is understood to be the emissions inventory of a site (plant, facility), including energy flows and material flows leaving or entering the system boundaries. Typically, inventory data are absolute data. Inventory data should represent the original data set without any corrections, adaptations, etc. (e.g. with regard to other energy indirect GHG emissions).

Performance assessment depends on the sector-specific conditions. Performance assessment may be based on absolute and/or (product-) specific data and may apply corrections or adaptations in order to allow a fair and transparent comparison of plants.

This document is not appropriate for use for life cycle analysis and product carbon footprint.

Stationary source emissions — Determination of greenhouse gas emissions in energy-intensive industries —

Part 1: General aspects

1 Scope

This document specifies principles and requirements for the determination of greenhouse gas (GHG) emissions from sector-specific sources such as from steel and iron, cement, aluminium, lime and ferroalloy-producing industries.

This document specifies definitions and requirements valid to the sector-specific parts of ISO 19694 series. It provides common methodological issues and defines the details for applying the requirements for the harmonized methods, which include:

a) measuring, testing and quantifying methods for GHG emissions of the above-mentioned sector-specific sources in the cited standards;

b) assessing the level of GHG emissions performance of production processes over time at production sites;

c) establishing and providing reliable, accurate and quality information for reporting and verification purposes.

The application of this document to the other sector-specific standards in the ISO 19694 series ensures accuracy, precision and reproducibility of the obtained results. For this reason, it is a generic standard.

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 14064-1:2018, *Greenhouse gases — Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals*

ISO 14956, *Air quality — Evaluation of the suitability of a measurement procedure by comparison with a required measurement uncertainty*

ISO 16911-1, *Stationary source emissions — Manual and automatic determination of velocity and volume flow rate in ducts — Part 1: Manual reference method*

ISO 16911-2, *Stationary source emissions — Manual and automatic determination of velocity and volume flow rate in ducts — Part 2: Automated measuring systems*

ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories*

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
absolute greenhouse gas emission
absolute GHG emission
GHG emissions (3.17) expressed as a mass stream

Note 1 to entry: It is expressed in tonnes of *carbon dioxide equivalent* (3.7) per year (tCO_2e/year).

3.2
alternative fuel
fuel materials or products used as a source of thermal energy and not classified as *traditional fuel* (3.43)

Note 1 to entry: In some industries, wastes such as plastics, solvents, waste oil, end-of-life tyres, etc. and different types of mixed or pure *biomass* (3.6) fuels are used as alternative fuel.

3.3
base year
specific, historical period identified for the purpose of comparing *GHG emissions* (3.17) or GHG removals or other GHG-related information over time

[SOURCE: ISO 14064-1:2018, 3.2.10]

3.4
biogenic carbon
carbon derived from *biomass* (3.6)

[SOURCE: ISO 14067:2018, 3.1.7.2]

3.5
biogenic carbon dioxide
biogenic CO_2
CO_2 obtained by the oxidation of *biogenic carbon* (3.4)

3.6
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.

Note 2 to entry: In this document, biomass excludes peat.

[SOURCE: ISO 14067:2018, 3.1.7.1]

3.7
carbon dioxide equivalent
CO_2e
unit for comparing the radiative forcing of a *GHG* (3.15) 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* (3.14).

[SOURCE: ISO 14064-1:2018, 3.1.13]

3.8
direct greenhouse gas emission
direct GHG emission
emission from *GHG sources* (3.20) owned or controlled by the reporting *organization* (3.32)

Note 1 to entry: This document uses the concepts of *equity share* (3.10) or *financial control* (3.12) or *operational control* (3.31) to establish *organizational boundaries* (3.33).

3.9
emissions report
stand-alone document intended to communicate an *organization's* (3.32) information related to *GHG* (3.15) and energy, including the results of its performance assessment

3.10
equity share
percentage of economic interest in, or benefit derived from, a *facility* (3.11)

Note 1 to entry: Under this approach, an *organization* (3.32) (corporation, group) or a company consolidates its *GHG emissions* (3.17) in accordance with the (pro rata) equity share it holds in each operation, i.e. in accordance with ownership. As an exception, no emissions are consolidated for so-called fixed asset investments where a company owns only a small part of the total shares of an operation and exerts neither significant influence nor *financial control* (3.12). Other possible exceptions relate to the economic substance of a relationship.

3.11
facility
single installation, set of installations or production *processes* (3.35) (stationary or mobile), which can be defined within a single geographical boundary, organizational unit or production process

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

3.12
financial control

ability of an *organization* (3.32) to direct the financial and operating policies of an operation with a view to gaining economic benefits from its activities

Note 1 to entry: The financial control usually exists if the organization has the right to the majority benefits of the operation, or if it retains the majority risks and rewards of ownership of the operation's assets. Under this approach, companies consolidate 100 % of the emissions of those operations over which they have financial control. As an exception, consolidation in accordance with *equity share* (3.10) is required for joint ventures where partners have joint financial control.

3.13
fossil carbon
carbon that is contained in fossilized material

Note 1 to entry: Examples of fossilized material are coal, oil and natural gas and peat.

[SOURCE: ISO 14067:2018, 3.1.7.3]

3.14
global warming potential
GWP
index, based on radiative properties of *GHGs* (3.15), 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)

[SOURCE: ISO 14064-1:2018, 3.1.12]

3.15
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 list of GHGs, see the latest Intergovernmental Panel on Climate Change (IPCC) Assessment Report[22].

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.

[SOURCE: ISO 14064-1:2018, 3.1.1]

3.16
greenhouse gas activity data
GHG activity data
activity data
quantitative measure of activity that results in a *GHG emission* (3.17) or GHG removal

[SOURCE: ISO 14064-1:2018, 3.2.1, modified — The term "activity data" has been added as a third term and the example has been deleted.]

3.17
greenhouse gas emission
GHG emission
release of a *GHG* (3.15) into the atmosphere

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

3.18
greenhouse gas emission factor
GHG emission factor
coefficient relating *GHG activity data* (3.16) with the *GHG emission* (3.17)

[SOURCE: ISO 14064-1:2018, 3.1.7, modified — Note to entry 1 has been deleted.]

3.19
greenhouse gas inventory
GHG inventory
list of *GHG sources* (3.20) and GHG sinks, and their quantified *GHG emissions* (3.17) and GHG removals

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

3.20
greenhouse gas source
GHG source
process (3.35) that releases a *GHG* (3.15) into the atmosphere

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

3.21
gross calorific value
GCV
amount of heat released during the combustion of a specified amount of a fuel.

Note 1 to entry: It includes the latent heat contained in water vapour, which is released when condensing water vapour so that all water is in liquid state (often expressed in GJ per tonne of fuel).

Note 2 to entry: Compare with the IPCC 2019 guidelines, Vol. II, Section 1.4.1.2[23].

Note 3 to entry: Also referred to as "higher heat value" (HHV).

3.22
indirect greenhouse gas emission
indirect GHG emission
GHG emission (3.17) that is a consequence of an *organization's* (3.32) operations and activities, but that arises from *GHG sources* (3.20) that are not owned or controlled by the organization

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

[SOURCE: ISO 14064-1:2018, 3.1.11]

3.23
key performance indicator
KPI
type of measure of performance used by industry

Note 1 to entry: KPIs are commonly used by an *organization* (3.32) to evaluate its success or the success of an activity in which it is engaged.

3.24
level of assurance
degree of confidence in the *GHG* (3.15) statement

[SOURCE: ISO 14064-1:2018, 3.4.13]

3.25
loss on ignition
test consisting of strongly heating (igniting) a sample of the material at a specified temperature, allowing volatile substances to escape, until its mass ceases to change

Note 1 to entry: This test is used in inorganic analytical chemistry, particularly in the analysis of minerals.

3.26
lower heat value
LHV
absolute value of the specific heat (enthalpy) of combustion, for unit mass of the fuel burned in oxygen at constant pressure under such conditions that all the water of the reaction products remains as water vapour (at 0,1 MPa), the other products being as for the *gross calorific value* (3.21), all at the reference temperature

Note 1 to entry: Also referred to as "net calorific value" (NCV).

[SOURCE: ISO 1928:2020, 3.1.3, modified — The term "net calorific value at constant volume" has been replaced with "lower heat value" and Note 1 to entry has been added.]

3.27
mass balance
relationship between input and output quantity of a specific substance in a defined system, taking into account the formation or decomposition of that substance in the system

3.28
mixed fuel
fuel that is a mix of *biomass* (3.6) and fossil fuel

Note 1 to entry: It is fuel with a certain *biogenic carbon* (3.4) content.

3.29
monitoring
continuous or periodic assessment of *GHG emissions* (3.17), GHG removals or other GHG-related data

[SOURCE: ISO 14064-1:2018, 3.2.12]