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Greenhouse gases — Quantification and reporting of greenhouse gas emissions arising from transport chain operations

Gaz à effet de serre — Quantification et déclaration des émissions de gaz à effet de serre résultant des opérations des chaînes de transport

Reference number
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Foreword

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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 and climate change management and related activities*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 320, *Transport — Logistics and services,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This first edition cancels and replaces IWA 16:2015, which has been technically revised throughout to expand the framework to a methodology.

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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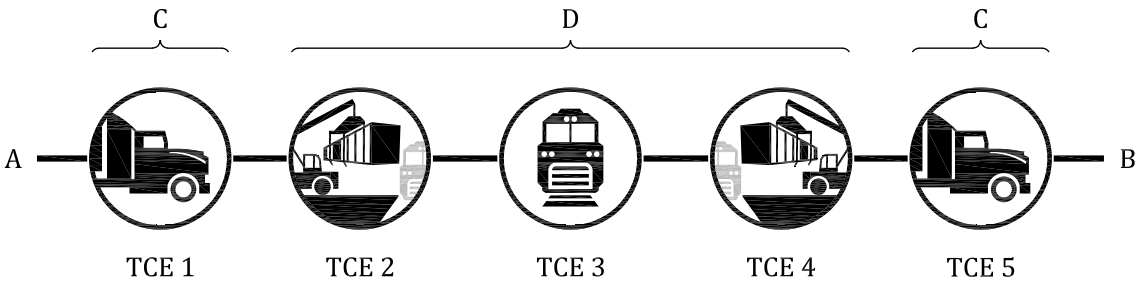
Introduction

This document provides requirements and guidance for the quantification and reporting of greenhouse gas (GHG) emissions for transport chains for passengers and freight.

This document provides such a calculation with its related reporting. It specifies how to source data as input for the calculation, taking into account that transport operations vary hugely, from multinational organizations operating multiple transport modes to deliver transport services across the globe, through small local operators delivering a simple service to a single user; hence this document has adopted a structure to make it widely applicable. To ensure that values for GHG emissions that result from vehicle and hub operation and associated energy provision are considered, this document takes into account the GHG emissions associated with production and distribution of energy (including, for example, production and distribution of liquid energy carriers or grid transmission of electricity). As a result, calculation results can enable a consistent comparison of possible different energy carriers by transport service operators, users and any other interested parties. Calculation results are only directly comparable if all options chosen are internally consistent.

This document covers all modes of transport (land, water or in the air, irrespective of the means of transport, i.e. vessel, vehicle or pipeline) and includes the operational GHG emissions from hubs where they facilitate transfer of freight or passengers from one element of a transport chain to the next. It takes account of operation of empty trips required for subsequent transportation of freight or passengers. It is applicable at all stages along the entire transport chain (see also illustrative examples in Figure 1 and Figure 2).

Figure 1 provides an illustrative example of a freight transport chain from the point where freight leaves its last point of production or transformation (A, freight consignor) to the point where freight reaches its first non-transport related operation (B, freight consignee). This transport chain consists of five transport chain elements (TCEs), the GHG emissions of which are calculated separately. The first and last TCEs (TCE 1, TCE 5) represent road services (C) covering pre- and on-carriage; TCE 2 to TCE 4 represent a rail freight service (D) composed of road/rail terminal operations (TCE 2, TCE 4) and main carriage by rail transport (TCE 3).



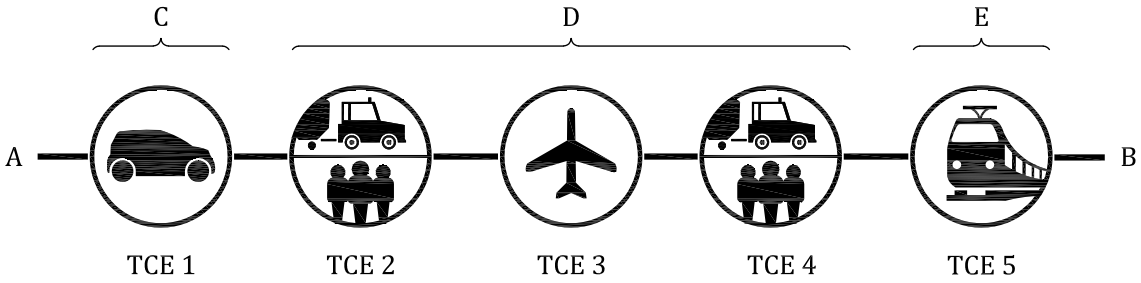
Key

A freight consignor
B freight consignee
C road services
D rail freight service

Figure 1 — Illustrative example of a multi-element freight transport chain

Figure 2 provides an illustrative example of a passenger transport chain from the point where passengers leave their departure location, A, to their destination, B. This transport chain consists of TCEs, the GHG emissions of which are calculated separately. The first TCE (TCE 1) represents transport of the passenger from home to the airport by private car (C); TCE 2 to TCE 4 represent an air travel service (D) composed of passenger terminal operations for the passenger and luggage (TCE 2, TCE 4) and main carriage by plane (TCE 3). The on-carriage represented by TCE 5 shows shuttle express via rail (E).

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Key

A departure location
B destination
C private car service
D air travel service
E shuttle express service via rail

Figure 2 — Illustrative example of a multi-element passenger transport chain

The reporting set out in this document reflects the need to report information between the parties in a transport chain because information known to the transport or hub operator, when reported to the user of their service, helps the latter to quantify, better manage and reduce the impacts of their transport or hub activities. This is a standard for GHG emission calculation only; therefore, offsetting is not part of this document.

This document is complementary to several existing standards. It is aligned with the ISO 14064 series and ISO 14067 (see Figure 3). It contributes to the carbon footprint of products (see ISO 14067) and the life cycle assessment in accordance with the ISO 14040 family of standards and ISO 14044. Figure 3 shows the relationship of this document to other International Standards of the ISO 14040 family of standards and the ISO 14060 family of standards, using the example of a freight transport chain and including possible stages within the life cycle of a product bought online as well as example topics to be covered by a company's GHG inventory.

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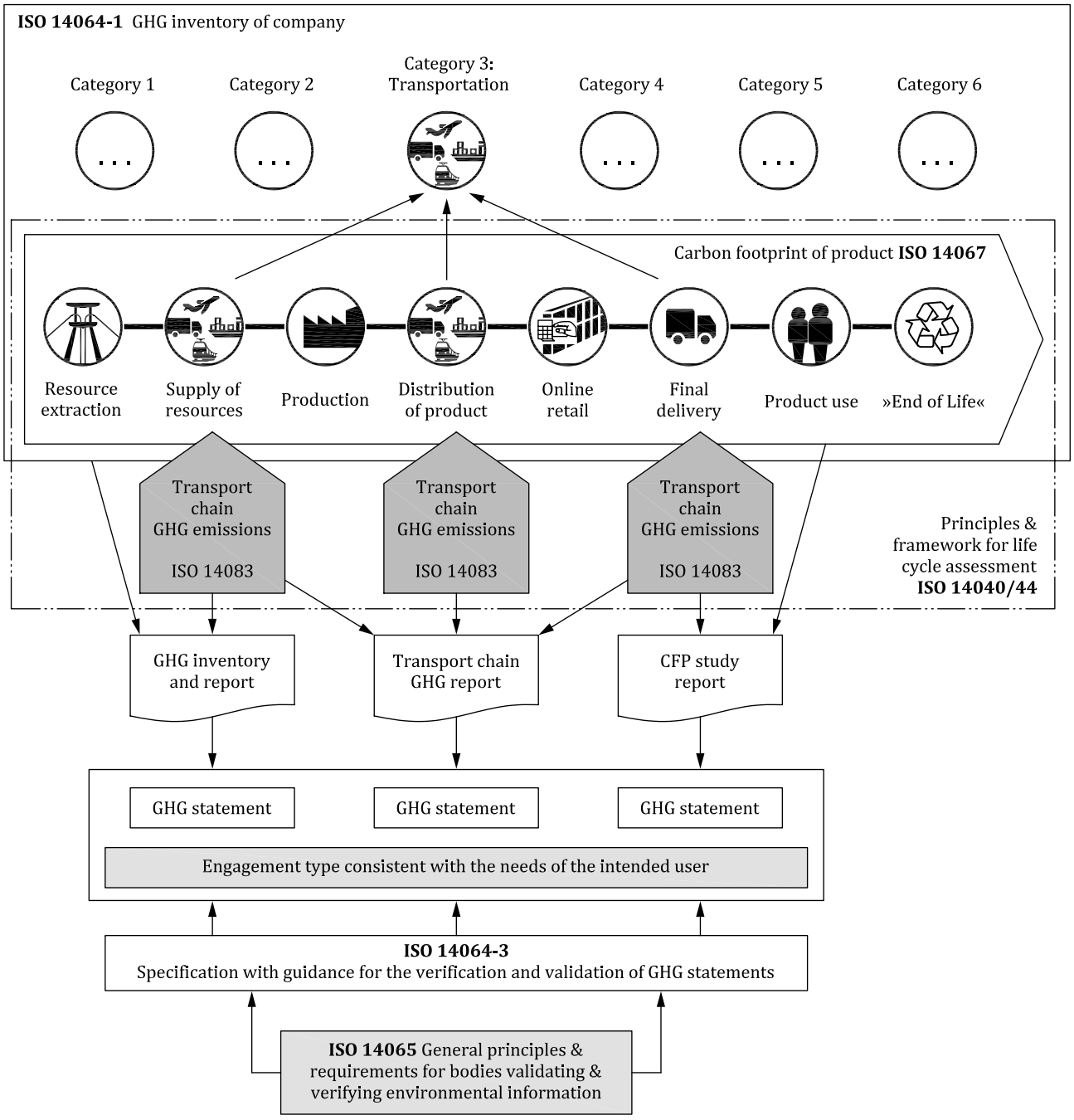


Figure 3 — Relationship between the ISO 14040 family of standards and the ISO 14060 family of standards, using the example of a freight transport chain

NOTE GHG emission intensity per tonne- or passenger-km calculated in accordance with this document can be used as primary or secondary data for GHG quantification projects in accordance with ISO 14067 and/or ISO 14064-1. These data require adaptation or modification if full life cycle based GHG-emissions are needed, e.g. vehicle manufacture or transport infrastructure provision.

The approach acknowledges, and is in line with, the valuable work conducted on GHG calculation and reporting that is documented in the aforementioned standards and by other protocols and organizations, including but not limited to, the United Nations Framework Convention on Climate Change (UNFCCC),[37] the GHG Protocol[16] and the Global Logistics Emissions Council (GLEC) Framework for Logistics Emissions Accounting and Reporting[15].

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Greenhouse gases — Quantification and reporting of greenhouse gas emissions arising from transport chain operations

1 Scope

This document establishes a common methodology for the quantification and reporting of greenhouse gas (GHG) emissions arising from the operation of transport chains of passengers and freight.

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 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/

3.1 Terms related to transport chain operations

3.1.1
cable car
ropeway
transport system where *vehicles* (3.1.35) are moved by at least one cable motorized by a machinery

Note 1 to entry: Vehicles circulating on cable(s) whose movement is not transmitted by at least one cable are not considered cable cars. Vertical elevators are also not considered cable cars.

3.1.2
charter
contract for the hire of a specific *vehicle* (3.1.35) from an owner for a specified period of time for the charterer's purposes subject to agreed restrictions

3.1.3
collection and delivery round
trip with the purpose to collect and/or deliver *freight* (3.1.7) at successive locations along the trip

Note 1 to entry: Typically, but not necessarily, the trip starts and ends at the same location.

3.1.4
consignment
separately identifiable amount of *freight* (3.1.7) transported from one consignor to one consignee via one or more modes of transport

Note 1 to entry: Although "consignment" and "*shipment*" (3.1.20) are common terms often considered as synonyms, in this document and other technical publications, a consignment is differentiated to a shipment. Indeed, a shipment refers to a grouping of freight corresponding to the shipper needs, whereas a consignment refers a grouping of freight according to a carrier or freight forwarder's transport solutions.

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[SOURCE: ISO 26683-1:2013, 3.9, modified — "freight" replaced "goods items (available to be)". "and specified in one single transport document" deleted. Note 1 to entry added.]

3.1.5
empty trip
section of the route of a *vehicle* (3.1.35) during which no *freight* (3.1.7) or *passenger* (3.1.16) is transported

EXAMPLE Vehicle (re)positioning trips, empty backhauls.

3.1.6
fleet
set of *vehicles* (3.1.35) operated by one *transport operator* (3.1.30)

3.1.7
freight
goods, materials, commodities, parcels, etc. being transported from one location to another

[SOURCE: EN 14943:2005, 3.437, modified — "materials, commodities, parcels, etc." added.]

3.1.8
hub
DEPRECATED: node
DEPRECATED: site
DEPRECATED: station
DEPRECATED: facility
DEPRECATED: centre
DEPRECATED: depot
location where *passengers* (3.1.16) transfer and/or *freight* (3.1.7) is transferred from one *vehicle* (3.1.35) or mode of transportation to another before, after or between different elements of a *transport chain* (3.1.25)

Note 1 to entry: Hubs include, but are not limited to, rail/road terminals, cross-docking sites, airport terminals, terminals at seaports and distribution centres.

3.1.9
hub activity
parameter that quantifies the *throughput* (3.1.21) of a *hub* (3.1.8)

3.1.10
hub equipment
equipment and facilities used within a *hub* (3.1.8) to transfer *freight* (3.1.7) or *passengers* (3.1.16)

3.1.11
hub operation
operation in order to transfer *freight* (3.1.7) or *passengers* (3.1.16) through a *hub* (3.1.8)

3.1.12
hub operation category
HOC
group of *hub operations* (3.1.11) that share similar characteristics

Note 1 to entry: Annex H contains examples of HOCs.

3.1.13
hub operator
entity that carries out *hub operations* (3.1.11) involving carriage of *freight* (3.1.7) or *passengers* (3.1.16), or both

3.1.14
hub service
service provided within a *hub* (3.1.8) *transport chain element* (3.1.26)

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3.1.15
load factor
ratio of the actual load to the maximum legally authorized load of a particular *vehicle* (3.1.35)

3.1.16
passenger
person carried by a *vehicle* (3.1.35)

Note 1 to entry: The term and its abbreviation "pax" are also used as a unit for quantity of passengers.

Note 2 to entry: Where the word "passengers" is used, it refers to one or more passengers unless specified in the context.

3.1.17
pipeline
long continuous line of pipes, including ancillary equipment, used for transporting *freight* (3.1.7)

[SOURCE: ISO 6707-1:2020, 3.1.2.30, modified — "freight" replaced "liquids or gases".]

3.1.18
pipeline transport
movement of a medium (liquid, gas, liquefied gas, slurry) through a system of pipes from one location to another

3.1.19
round trip
group of sequential journeys that start and end in the same place, whatever the intermediate routing

3.1.20
shipment
identifiable collection of one or more *freight* (3.1.7) items (available to be) transported together from the original shipper to the ultimate consignee

Note 1 to entry: A shipment may be transported in one or a multiple number of *consignments* (3.1.4).

Note 2 to entry: A shipment can be aggregated or disaggregated to different consignments according to the requirements of the means of transportation on any one element of the *transport chain* (3.1.25), e.g. single bulk units and packages can be aggregated on a pallet and such pallet can be handed over as a unit for aggregation in a container, which in turn is treated as a consignment in a *vehicle* (3.1.35).

Note 3 to entry: Although "consignment" and "shipment" are common terms often considered as synonyms, in this document and other technical publications, a consignment is differentiated to a shipment. Indeed, a shipment refers to a grouping of freight corresponding to the shipper needs, whereas a consignment refers a grouping of freight according to a carrier or freight forwarder's transport solutions.

[SOURCE: ISO 26683-1:2013, 3.34, modified — "freight" replaced "goods". Notes 2 and 3 to entry added.]

3.1.21
throughput
quantity of *passengers* (3.1.16) or *freight* (3.1.7) handled, sorted, cross-docked or transferred within and between modes at a *hub* (3.1.8)

3.1.22
transhipment
action by which *freight* (3.1.7) is transferred from one means of transport to another during the course of one *transport chain* (3.1.25)

[SOURCE: EN 14943:2005, 3.1154, modified — "transport chain" replaced "transport operations", and the second part of the definition deleted.]

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3.1.23
transport
movement of *passengers* (3.1.16) and/or *freight* (3.1.7) from one location to another performed by modes of transport such as air, *cable car* (3.1.1), inland waterway, *pipeline* (3.1.17), rail, road and sea

[SOURCE: ISO 26683-1:2013, 3.37, modified — "passengers and/or freight" replaced "people and "goods", "of transport" added and the following list changed, "and the field comprises the attributes of infrastructure, vehicles and operations" deleted.]

3.1.24
transport activity
parameter that quantifies *passenger* (3.1.16) or *freight* (3.1.7) *transport* (3.1.23)

3.1.25
transport chain
sequence of elements related to *freight* (3.1.7) or a (group of) *passenger(s)* (3.1.16) that, when taken together, constitutes its movement from an origin to a destination

Note 1 to entry: A passenger or a group of passengers can include their luggage and, if any, their *vehicles* (3.1.35).

Note 2 to entry: Where there are two or more elements, in the majority of cases, one of them implies that the freight or passengers use a *hub* (3.1.8).

3.1.26
transport chain element
TCE
section of a *transport chain* (3.1.25) within which the *freight* (3.1.7) or a (group of) *passenger(s)* (3.1.16) is carried by a single *vehicle* (3.1.35) or transits through a single *hub* (3.1.8)

EXAMPLE If a multimodal trip of a passenger includes taking a bus from stop "L4" to stop "L7" of bus line "L", then one TCE is the trip of the passenger from "L4" to "L7".

Note 1 to entry: See Figures 4 and 5.

3.1.27
transport distance
distance between the origin and the destination of a *passenger* (3.1.16), a *consignment* (3.1.4) or a *vehicle* (3.1.35) along a specified route

Note 1 to entry: For the use of this document, the route followed by the passenger, the *freight* (3.1.7) or the vehicle may be different from that originally planned. This leads to two categories of transport distances: *actual distances* (3.1.27.1), and distances used for calculation of *greenhouse gas emissions* (3.2.8), i.e. *transport activity distances* (3.1.27.4).

3.1.27.1
actual distance
transport distance (3.1.27) along the actual route taken by a *vehicle* (3.1.35)

EXAMPLE Distance measured by an on-board device (odometer).

3.1.27.2
great circle distance
GCD
transport distance (3.1.27) determined as the shortest distance between any two points measured along the surface of a sphere

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3.1.27.3
shortest feasible distance
SFD
DEPRECATED: planned distance
DEPRECATED: network distance
transport distance (3.1.27) determined as the distance achievable by the shortest practical route available according to the infrastructure options for a particular *vehicle* (3.1.35) type

Note 1 to entry: "Shortest practical route" implies that small detours from the shortest distance, e.g. to avoid congested city centres or rural roads unsuitable for certain vehicle sizes, can be included.

3.1.27.4
transport activity distance
transport distance (3.1.27) related to *passengers* (3.1.16) or *freight* (3.1.7) moved, used as a parameter for calculation of *transport activity* (3.1.24)

3.1.28
transport operation
operation of a *vehicle* (3.1.35) in order to transport *passengers* (3.1.16) and/or *freight* (3.1.7)

EXAMPLE If a multimodal trip of a passenger includes taking a bus from stop "L4" to stop "L7" of bus line "L", this requires a transport operation being the operation of this bus on line "L", from the first stop "L1" to the last stop of this bus line.

Note 1 to entry: It includes cases where the destination is the same as the origin passing through other locations on the way.

3.1.29
transport operation category
TOC
group of *transport operations* (3.1.28) that share similar characteristics

Note 1 to entry: Annexes A to G contain recommendations for the characteristics used to specify the TOCs for each transport mode.

3.1.30
transport operator
entity that carries out *transport operations* (3.1.28) involving carriage of *freight* (3.1.7) or *passengers* (3.1.16), or both

3.1.31
transport service
service provided to a *transport service user* (3.1.33) for the *transport* (3.1.23) of *freight* (3.1.7) or a *passenger* (3.1.16) from an origin to a destination

Note 1 to entry: A transport service can imply multiple *transport chain elements* (3.1.26), requiring both *transport operations* (3.1.28) and *hub operations* (3.1.11), as shown in Figure 1 and Figure 2.

3.1.32
transport service organizer
entity that provides *transport services* (3.1.31), within which the operation of some *transport chain elements* (3.1.26) are subcontracted to one or more other entities that operate them

Note 1 to entry: A transport service organizer acts as an intermediary between the *transport operator* (3.1.30) or *hub operator* (3.1.13) and the *transport service user* (3.1.33). A transport service organizer can act as the transport operator or hub operator for some of the transport chain elements that comprise the overall service.

Note 2 to entry: A transport service organizer can be, for example, a freight forwarder, an entity organizing trips/travel (e.g. travel agency, tour operator) or a local authority responsible for public passenger transport.

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3.1.33
transport service user
entity that buys and/or uses a *transport service* (3.1.31)

Note 1 to entry: A transport service user can be a *passenger* (3.1.16), a shipper or a *transport service organizer* (3.1.32).

3.1.34
twenty-foot equivalent unit
TEU
standard unit used to express a number of containers of various lengths and for describing the capacities of container ships or terminals

[SOURCE: EN 14943:2005, 3.1166]

3.1.35
vehicle
any means of *transport* (3.1.23)

Note 1 to entry: Including, for example, vessels, drones and *pipeline* (3.1.17), whether driven by an operator or wholly (or partially) autonomous.

3.1.36
vehicle operation
deployment of a *vehicle* (3.1.35) to fully or partially provide a *transport operation* (3.1.28)

3.2 Terms related to greenhouse gases and energy

3.2.1
carbon dioxide equivalent
CO_2e
unit for comparing the radiative forcing of a *greenhouse gas* (*GHG)* (3.2.5) 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* (3.2.4).

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

3.2.2
energy carrier
substance or phenomenon that can be used to produce mechanical work or heat or to operate chemical or physical processes

Note 1 to entry: For the purposes of this document, energy carriers can be electricity, fuels (fossil, biofuels, synthetic and blends), steam, heat, compressed air or other similar media, which can be purchased, stored, treated or used in a piece of equipment or in a process, or recovered.

Note 2 to entry: Where required for the quantification of *greenhouse gas activities* (3.2.6), quantities of energy carriers should be expressed in a manner that is unambiguous for subsequent calculation steps. This may be in units of volume (e.g. litre, m^3), mass (e.g. kg) or energy (J, kWh), or multiples thereof.

[SOURCE: ISO 52000-1:2017, 3.4.9, modified — Notes 1 and 2 to entry added.]

3.2.3
energy consumption
quantity of energy applied

Note 1 to entry: Energy consumption is a specific form of *greenhouse gas activity data* (3.2.7).

[SOURCE: ISO 50001:2018, 3.5.2, modified — Note 1 to entry added.]

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3.2.4
global warming potential
GWP
index, based on radiative properties of *greenhouse gas (GHG)* (3.2.5), 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.]

3.2.5
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[32].

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]

3.2.6
greenhouse gas activity
GHG activity
activity that results in a *GHG emission* (3.2.8)

EXAMPLE Consumption of energy, refrigerant leakage, methane slip.

3.2.7
greenhouse gas activity data
GHG activity data
quantitative measure of *GHG activity* (3.2.6)

[SOURCE: ISO 14064-1:2018, 3.2.1, modified — "GHG activity" replaced "activity that results in a GHG emission or GHG removal". Example deleted.]

3.2.8
greenhouse gas emission
GHG emission
release of a *GHG* (3.2.5) into the atmosphere

Note 1 to entry: It is expressed in mass of *carbon dioxide equivalent* (3.2.1).

Note 2 to entry: GHG emissions are categorized in this document according to their sources, as follows:

— *hub equipment energy provision GHG emissions* (G_{HEEP}) (3.2.8.1);

— *hub equipment operation GHG emissions* (G_{HEO}) (3.2.8.2);

— *packaging life cycle GHG emissions* (G_{PL}) (3.2.8.3);

— *vehicle energy provision GHG emissions* (G_{VEP}) (3.2.8.4);

— *vehicle operation GHG emissions* (G_{VO}) (3.2.8.5);

— *total operation GHG emissions* (G_{TO}) (3.2.8.6);

— *total energy provision GHG emissions* (G_{TEP}) (3.2.8.7);

— *total GHG emissions* (G_T) (3.2.8.8).

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Note 3 to entry: The symbol notation within this document follows the following procedure: "$G_{X,Y}$" refers to the GHG emissions of category X ("X" being vehicle operation, hub equipment operation, etc.) for Y, where "Y" can be a *transport operation category* (3.1.29), a *hub operation category* (3.1.12), a *transport chain* (3.1.25), a *transport chain element* (3.1.26), or any set thereof.

[SOURCE: ISO 14064-1:2018, 3.1.5, modified — Notes 1, 2 and 3 to entry added.]

3.2.8.1
hub equipment energy provision greenhouse gas emission
hub equipment energy provision GHG emission
G_{HEEP}
release of a *GHG* (3.2.5) into the atmosphere during the process of producing, storing, processing and distributing an *energy carrier* (3.2.2) for *hub equipment* (3.1.10) operation

3.2.8.2
hub equipment operation greenhouse gas emission
hub equipment operation GHG emission
G_{HEO}
release of a *GHG* (3.2.5) into the atmosphere as a result of *hub equipment* (3.1.10) operation

3.2.8.3
packaging life cycle greenhouse gas emission
packaging life cycle GHG emission
G_{PL}
release of a *GHG* (3.2.5) into the atmosphere during the life cycle *processes* (3.4.3) of *packaging* (3.4.2)

3.2.8.4
vehicle energy provision greenhouse gas emission
vehicle energy provision GHG emission
G_{VEP}
release of a *GHG* (3.2.5) into the atmosphere during the process of producing, storing, processing and distributing an *energy carrier* (3.2.2) for *vehicle operation* (3.1.36)

3.2.8.5
vehicle operation greenhouse gas emission
vehicle operation GHG emission
G_{VO}
release of a *GHG* (3.2.5) into the atmosphere as a result of *vehicle operation* (3.1.36)

3.2.8.6
total operation greenhouse gas emission
total operation GHG emission
G_{TO}
sum of *GHG emissions* (3.2.8) from operational *processes* (3.4.3) included in the system boundaries

3.2.8.7
total energy provision greenhouse gas emission
total energy provision GHG emission
G_{TEP}
sum of *GHG emissions* (3.2.8) from energy provision *processes* (3.4.3) included in the system boundaries

3.2.8.8
total greenhouse gas emission
total GHG emission
G_{T}
sum of *GHG emissions* (3.2.8) from all *processes* (3.4.3) included in the system boundaries

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3.2.9
greenhouse gas emission factor
GHG emission factor
coefficient relating *GHG activity data* (3.2.7) with the *GHG emission* (3.2.8)

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

3.2.10
greenhouse gas emission intensity
GHG emission intensity
coefficient relating specified *GHG activity data* (3.2.7) with the *GHG emission* (3.2.8)

Note 1 to entry: It can be expressed as:

— mass carbon dioxide equivalent (CO_2e) per tonne kilometre, or equivalent units, for freight transportation;

— mass CO_2e per tonne for freight hub *throughput* (3.1.21);

— mass CO_2e per passenger kilometre, or equivalent units, for passenger transport;

— mass CO_2e per passenger for passenger hub throughput.

3.2.11
greenhouse gas source
GHG source
process (3.4.3) that releases a *GHG* (3.2.5) into the atmosphere

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

3.3 Terms related to quantification

3.3.1
allocation
partitioning the input or output flows of a *process* (3.4.3) or product system between the product system under study and one or more other product systems

Note 1 to entry: In this document, the definition is understood as partitioning *greenhouse gas (GHG) activity* (3.2.6) or *GHG emissions* (3.2.8) related to *transport operations* (3.1.28) and *hub operations* (3.1.11) with multiple functionalities, between groups of entities (*freight* (3.1.7) and/or *passengers* (3.1.16)) carried or transferred that benefit from the same functionality.

EXAMPLE 1 For an air transport operation with an aircraft carrying both passengers and belly freight, the total GHG emissions of the transport operation can be partitioned between freight and passengers.

EXAMPLE 2 For a sea transport operation on a container ship carrying both dry and reefer containers, the GHG activity for temperature control of reefer containers can be allocated to reefer containers only.

[SOURCE: ISO 14040:2006, 3.17, modified — Note 1 to entry, Example 1 and Example 2 added.]

3.3.2
class factor
z
ratio based on a calculation, aiming to characterize a class of *passengers* (3.1.16) in comparison with the lowest class

3.3.3
primary data
quantified value of a *process* (3.4.3) or an activity obtained from a direct measurement or a calculation based on direct measurements

Note 1 to entry: Primary data can include *greenhouse gas (GHG) emission factors* (3.2.9) and/or *GHG activity data* (3.2.7).

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[SOURCE: ISO 14067:2018, 3.1.6.1, modified — Note 1 to entry deleted. Note 2 to entry renumbered as Note 1 to entry.]

3.3.4
secondary data
data which do not fulfil the requirements for *primary data* (3.3.3)

Note 1 to entry: Secondary data can include data from databases and published literature, default *greenhouse gas emission factors* (3.2.9) from national inventories, calculated data, estimates or other representative data, and data obtained from proxy processes or estimates.

Note 2 to entry: In this document, secondary data are either *modelled data* (3.3.4.1) or *default value* (3.3.4.2).

[SOURCE: ISO 14067:2018, 3.1.6.3, modified — "greenhouse gas" and "and data obtained from proxy processes or estimates" added, and "validated by competent authorities" deleted in Note 1 to entry. Note 2 to entry replaced.]

3.3.4.1
modelled data
data established by use of a model that takes into account *primary data* (3.3.3) and/or greenhouse gas (GHG) emission-relevant parameters of a *transport operation* (3.1.28) or *hub operation* (3.1.11)

Note 1 to entry: Relevant parameters can be vehicle size, *load factor* (3.1.15), fuel type and quality, topography, speed, etc., thereby reflecting a representative value of the transport operation's *GHG emissions* (3.2.8).

3.3.4.2
default value
secondary data (3.3.4) value drawn from a published source

Note 1 to entry: Such values can be established by use of a model, but they will not necessarily correspond to the greenhouse gas emission-relevant parameters of the *transport operation* (3.1.28) or *hub operation* (3.1.11) being evaluated.

Note 2 to entry: See Annex Q for examples of sources for default values.

3.3.5
distance adjustment factor
DAF
ratio between the *actual distance* (3.1.27.1) and the *transport activity distance* (3.1.27.4), related to same origin and destination locations

EXAMPLE Ratio between "actual distance" and "*shortest feasible distance*" (3.1.27.3).

3.3.6
cut-off criteria
specification of the amount of material or energy flow or the level of significance of *greenhouse gas (GHG) emissions* (3.2.8) associated with unit *processes* (3.4.3) or the *transport chain* (3.1.25) to be excluded from a GHG quantification

Note 1 to entry: See 5.2.3 for examples.

Note 2 to entry: "Energy flow" is defined in ISO 14040:2006, 3.13.

[SOURCE: ISO 14044:2006, 3.18, modified — "significance of greenhouse gas (GHG) emissions" has replaced "environmental significance", "the transport chain" has replaced "product system", "GHG quantification" has replaced "study". Notes to entry added.]

3.3.7
passenger equivalent
peq
unit of quantification of *freight* (3.1.7), *passengers* (3.1.16) and passenger vehicles in the case of combined *transport* (3.1.23) of freight with passengers, for which each of these entities is compared to an average passenger

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3.3.8
passenger of lowest class equivalent
plceq
unit of quantification of *passengers* (3.1.16) in the case of passenger transport with different classes, for which passengers of each class are compared to a passenger in the lowest class

3.4 Other terms

3.4.1
offsetting
mechanism for compensating for *greenhouse gas (GHG) emissions* (3.2.8) of a *process* (3.4.3) through the prevention of the release of, reduction in, or removal of, an equivalent amount of GHG emissions in a process outside the boundary of the process system

[SOURCE: ISO 14021:2016, 3.1.12, modified — "greenhouse gas (GHG) emissions of a process" replaced "the carbon footprint of a product" and "process system" replaced "product system".]

3.4.2
packaging
materials used for the containment, protection, handling, delivery and presentation of *freight* (3.1.7)

Note 1 to entry: Packaging may be further categorized into:

— primary packaging, which is designed to come into direct contact with the product;

— secondary packaging, which is designed to contain one or more products together with any primary packaging required;

— *transport packaging* (3.4.4).

3.4.3
process
set of interrelated or interacting activities that transforms inputs into outputs

[SOURCE: ISO 14044:2006, 3.11]

3.4.4
transport packaging
tertiary packaging
distribution packaging
protective packaging
packaging (3.4.2) designed to contain one or more articles or packages, or bulk material, for the purposes of *transport* (3.1.23), handling and/or distribution

Note 1 to entry: Transport packaging does not include road, rail, ship and air containers.

4 General 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, data and methodologies appropriate to the needs of the intended user.

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