SLOVENSKI STANDARD
SIST EN 16258:2013

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Metode za izračun in objavo rabe energije in izpustov toplogrednih plinov pri transportnih storitvah (transport blaga in oseb)

Methodology for calculation and declaration of energy consumption and GHG emissions of transport services (freight and passengers)

Methode zur Berechnung und Deklaration des Energieverbrauchs und der Treibhausgasemissionen bei Transportdienstleistungen (Güter- und Personenverkehr)

Méthodologie pour le calcul et la déclaration de la consommation d'énergie et des émissions de gaz à effet de serre (GES) des prestations de transport (fret et passagers)

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Methodology for calculation and declaration of energy consumption and GHG emissions of transport services (freight and passengers)

Méthodologie pour le calcul et la déclaration de la consommation d'énergie et des émissions de gaz à effet de serre (GES) des prestations de transport (passagers et fret)

Methode zur Berechnung und Deklaration des Energieverbrauchs und der Treibhausgasemissionen bei Transportdienstleistungen (Güter- und Personenverkehr)

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Foreword

This document (EN 16258:2012) has been prepared by Technical Committee CEN/TC 320 “Transport - Logistics and services”, the secretariat of which is held by NEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by May 2013, and conflicting national standards shall be withdrawn at the latest by May 2013.

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Introduction

This standard sets out the methodology and requirements for calculating and reporting energy consumption and greenhouse gas (GHG) emissions in transport services. This first edition of the standard is primarily focused on energy consumption and GHG emissions associated with vehicles (used on land, water and in the air) during the operational phase of the lifecycle. However, when calculating the energy consumption and emissions associated with vehicles, account is also taken of the energy consumption and emissions associated with energy processes for fuels and/or electricity used by vehicles (including for example production and distribution of transport fuels). This ensures the standard takes a "well-to-wheel" approach when undertaking calculations, and when making declarations to transport service users.

The philosophy, contents, and structure adopted in this standard seek to make it widely applicable across the transport sector (encompassing all modes impartially) and accessible to a very diverse user group. Within this sector, it is recognised that transport operations vary hugely, from multi-national organisations operating multiple transport modes to deliver transport services across the globe, through to a small local operator delivering a simple service to one user. In addition, the potential user group for this standard is similarly diverse, and the monitoring of transport energy and emissions within organisations can be at different levels of maturity and sophistication. Consequently, this first edition of the standard balances the desire for absolute precision and scientific rigour with a degree of pragmatism in order to achieve ease of use, accessibility and encourage widespread use.

Use of this standard will provide a common approach and frameworks for the calculation and declaration of energy consumption and emissions for transport services irrespective of the level of complexity (e.g. a simple transport service can provide one customer with a single journey, whereas a complex system can involve several legs, multiple vehicle types, different transport modes and several companies within the transport supply chain). The standard ensures declarations have greater consistency and transparency, and that the energy and emissions are fully allocated to a vehicle's load (passengers and/or cargo).

It is anticipated that future editions of the standard will have broader quantification boundaries, to include additional aspects such as, transport terminals, transhipment activities, and other phases of the lifecycle. Users of the standard that would now like to use broader quantification boundaries, without waiting for a new edition of the standard are advised to communicate such results separately from the ones calculated according to this standard, and to give a transparent description of the methodology applied.

1 Scope

This European Standard establishes a common methodology for the calculation and declaration of energy consumption and greenhouse gas (GHG) emissions related to any transport service (of freight, passengers or both).

It specifies general principles, definitions, system boundaries, calculation methods, apportionment rules (allocation) and data recommendations, with the objective to promote standardised, accurate, credible and verifiable declarations, regarding energy consumption and GHG emissions related to any transport service quantified. It also includes examples on the application of the principles.

Potential users of this standard are any person or organisation who needs to refer to a standardised methodology when communicating the results of the quantification of energy consumption and GHG emissions related to a transport service, especially:

— transport service operators (freight or passengers carriers);

— transport service organisers (carriers subcontracting transport operations, freight forwarders and travel agencies);

— transport service users (shippers and passengers).

2 Terms, definitions and abbreviations

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

2.1 General terms

2.1.1
carbon dioxide equivalent
CO_2e
unit for comparing the radiative forcing of a GHG to 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

[SOURCE: ISO 14064-1:2006]

2.1.2
carbon offsetting
mechanism for compensating for carbon emissions of a process through the prevention of the release of, reduction in, or removal of, an equivalent amount of GHG emissions outside the boundary of that process, provided such prevention, removal or reduction are quantified, permanent and additional to a business-as-usual scenario

[SOURCE: adapted from ISO 14021:2010]

2.1.3
cargo
collection / quantity of goods (carried on a means of transport) transported from one place to another

Note 1 to entry: Cargo can consist of either liquid or solid materials or substances, without any packaging (e.g. bulk cargo), or of loose items of unpacked goods, packages, unitised goods (on pallets or in containers) or goods loaded on transport units and carried on active means of transport.

[SOURCE: EN 14943:2005]

2.1.4
energy
electricity, fuels, steam, heat, compressed air and other like media

[SOURCE: EN ISO 50001:2011 modified]

2.1.5
energy carrier
substance or phenomenon that can be used to produce mechanical work or heat or to operate chemical or physical processes

[SOURCE: ISO 13600:1997]

2.1.6
energy consumption
quantity of energy applied

[SOURCE: EN ISO 50001:2011]

2.1.7
energy factor
factor relating activity data to energy consumption

2.1.8
energy use
manner or kind of application of energy

EXAMPLE Vehicle propulsion, cooling, heating.

[SOURCE: EN ISO 50001:2011 modified]

2.1.9
freight
goods being transported from one location to another

[SOURCE: EN 14943:2005]

2.1.10
fuel consumption
quantity of energy carrier used by the means of transport

Note 1 to entry: For reasons of simplification, this definition includes all energy carriers, such as electricity.

Note 2 to entry: For rail transport using electric traction, the fuel consumption is the total quantity of energy collected from the contact line minus any energy returned to the contact line by the vehicle. Energy is returned (to the contact line) when electric traction has regenerative braking and the energy generated during braking is made available to other consumers connected to the contact line.

2.1.11
global warming potential
GWP
factor describing the radiative forcing impact of one mass-based unit of a given green house gas relative to an equivalent unit of carbon dioxide over a period of one hundred years

[SOURCE: ISO 14064-1:2006 modified]

2.1.12
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: In this standard, GHGs are limited to, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulfur hexafluoride (SF_6). There are the six gases listed in Annex A of the Kyoto Protocol to the United Nations Framework Convention on Climate Change.

[SOURCE: ISO 14064-1:2006 modified]

2.1.13
greenhouse gas emission factor
GHG emission factor
factor relating activity data to GHG emissions

2.1.14
means of transport
particular vessel, vehicle, or other mobile device used for the transport of passenger and/or freight

[SOURCE: EN 14943:2005 modified]

2.1.15
passenger
pax
person carried in a vehicle, without participating in its operation

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

2.1.16
route
path (to be) taken to get from one point to another point

[SOURCE: EN 14943:2005 modified]

2.1.17
transport
assisted movement of passenger and/or freight

Note 1 to entry: The term "transport" in general is used for movement supported by means.

[SOURCE: EN 14943:2005 modified]

2.1.18
Twenty-Foot Equivalent Unit
TEU
standard unit (6,10 m) used to express a number of containers of various lengths and for describing the capacities of container ships or terminals

Note 1 to entry: One standard forty-foot ISO Series container equals 2 TEUs.

[SOURCE: EN 14943:2005 modified]

2.1.19
vehicle
any means of transport

Note 1 to entry: Within this standard, this definition includes vessels (watercraft and aircraft like ships, boats, and planes), for reasons of simplification only.

2.2 Specific terms

2.2.1
default value
external value which is not determined by the transport service operator

Note 1 to entry: Guidelines related to the use of this concept are given in 5.4 of this standard.

2.2.2
empty trip
section of the route of a vehicle during which no cargo or passenger is transported

EXAMPLE Positioning trips are empty trips.

2.2.3
energy process
operational process taking place upstream of the level of the vehicle, needed for all energy carrier used by the vehicle

2.2.4
fleet
set of vehicles operated by one transport service operator

2.2.5
Great Circle Distance
theoretical shortest distance between any two points on the surface of the planet measured along a path on the surface of the sphere (as opposed to going through the sphere's interior)

2.2.6
load
quantity or nature of whatever is being carried by a vehicle

[SOURCE: EN 14943:2005 modified]

2.2.7
leg (of a transport service)
for a transport service of a cargo or a passenger, section of the route taken or to be taken within which the cargo or the passenger is carried by the vehicle

2.2.8
load factor
ratio of the actual load and the maximum authorised load of one means of transport

Note 1 to entry: Different dimensions are used for the measurement of the capacity, such as mass and volume.

[SOURCE: EN 14943:2005 modified]

2.2.9
marginal accounting
Method of allocation consisting in differentiation of entities on the basis of non-physical criteria

EXAMPLE For a flight, most of the fuel consumption is allocated to passengers, and belly freight is allocated only of the extra fuel consumption corresponding to the extra weight of the plane.

2.2.10
process
activity using energy and/or emitting GHG

2.2.11
specific measured value
value measured for a specific aspect of the calculation being performed

2.2.12
shortest feasible distance
distance actually achievable by the shortest route, with the vehicle considered

2.2.13
tank-to-wheels assessment
assessment related to the vehicle processes

2.2.14
transport activity
quantity of passenger, cargo or vehicles movements

EXAMPLE Two thousand passenger kilometres, one thousand five hundred tonne kilometres, one hundred pallets carried, five hundred vehicle kilometres.

2.2.15
transport operator fleet value
value established by the transport service operator on the basis of measurements of the transport activity of a fleet that includes the type of vehicle for which the calculation is being performed

2.2.16
transport operator specific value
value established by the transport service operator on the basis of measurements, specifically for the type of vehicle or the type of route for which the calculation is being performed

2.2.17
transport service
service provided to a beneficiary for the transport of a cargo or a passenger from a departure point to a destination point

Note 1 to entry: The beneficiary is named “transport service user”; see definition 2.2.20

2.2.18
transport service organiser
entity that provides transport services which are subcontracted to another entity (transport service operator) which operates them

Note 1 to entry: A transport service organiser can be a freight forwarder, an entity organising trips/travel (e.g.: travel agency, tour operator), a local authority responsible of public passenger transport

2.2.19
transport service operator
entity that carries out transport services

Note 1 to entry: A transport service operator can be a passenger's carrier (acting directly for passengers or as sub-contractor of a transport service organiser), a freight carrier (acting directly for shippers or as sub-contractor of a transport service organiser).

2.2.20
transport service user
entity that buys and/or uses a transport service

Note 1 to entry: A transport service user can be a passenger, a shipper, or a transport service organiser (for the transport services sub contracted to transport service operators).

2.2.21
vehicle operation
deployment of a vehicle to fully or partially provide a transport service for one or more transport service users

2.2.22
vehicle operation system
VOS
set of vehicle operations

Note 1 to entry: Guidelines and examples related to the use of this concept are given in Clause 7 and Annexes C, E and F of this standard

2.2.23
vehicle process
process taking place at the level of a vehicle, corresponding to operation of engines on board

2.2.24
well-to-tank assessment
assessment related to the energy processes

2.2.25
well-to-wheels assessment
assessment related to both vehicle and energy processes

3 Units and symbols

3.1 Energy

Quantities of energy shall be expressed in joule (J) or multiple thereof such as megajoule (MJ) or gigajoule (GJ).

3.2 GHG emissions

Quantities of GHG emissions shall be expressed in gram (g) of carbon dioxide equivalent (CO_2e) or multiples thereof such as kilogram (kg) or tonne (t) of CO_2e.

4 Quantification boundaries

4.1 General

The processes in the following subclauses relate to the transport service being assessed and are not limited by organisational boundaries.

4.2 Processes included

The assessment of energy consumption and GHG emissions of a transport service shall include both vehicle operational processes and energy operational processes that occur during the operational phase of the lifecycle.

The vehicle operational processes shall include operation of all on-board vehicle systems including propulsion and ancillary services.

EXAMPLES Main engines, ancillary equipment used to maintain the temperature of the cargo space, handling or transhipment devices on board are on-board vehicle systems which operation is included.

The energy operational processes shall include:

— for fuels: extraction or cultivation of primary energy, refining, transformation, transport and distribution of energy at all steps of the production of the fuel used;

— for electricity: extraction and transport of primary energy, transformation, power generation, losses in electricity grids.

NOTE 1 Details of excluded processes and examples are given in 4.3.

NOTE 2 Careful use of European Directives on fuels and electricity such as Directive 2009/30/EC on Fuel Quality and Directive 2009/72/EC on internal market in electricity can assist in quantifying energy processes in the context of this standard. However, it has to be pointed out that calculations done in accordance with Directive 2009/72/EC could include only CO_2 and only the upstream processes from power plants to the customer, and so not all operational energy processes and all gases required by this CEN standard.

4.3 Processes not included

The assessment of energy consumption and GHG emissions of a transport service shall not include, in particular:

— direct emissions of GHG resulting from leakage (of refrigerant gas or natural gas for example) at the vehicle level;

— additional impacts of combustion of aviation fuel in high atmosphere, like contrails, cirrus, etc.;

— processes consisting of short-term assistance to the vehicle for security or movement reasons, with other devices like tugboats for towing vessels in harbours, aircraft tractors for planes in airports, etc;

— processes implemented by external handling or transhipment devices (for freight), or by external movement devices (for passengers, like elevators and moving walkways), for the movement or transhipments of freight or the movement of passengers. In express delivery services and other transport services organised in networks, handling operations that take place inside platforms, and consisting of loading and unloading of parcels or pallets, belong to this category of processes;

— processes at the administrative (overhead) level of the organisations involved in the transport services. These processes can be operation of buildings, staff commuting and business trips, computer systems, etc;

— processes for the construction, maintenance, and scrapping of vehicles;

— processes of construction, service, maintenance, and dismantling of transport infrastructures used by vehicles;

— non operational energy processes, like the production or construction of extraction equipments, of transport and distribution systems, of refinery systems, of enrichment systems, of power production plants, etc. so as their reuse, recycle and scrap.

4.4 Greenhouse gases

Calculation of GHG emissions shall include all the following six gases: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydro fluorocarbons (HFCs), per fluorocarbons (PFCs) and sulphur hexafluoride (SF_6). Any other gas shall be excluded.

4.5 Carbon offsetting and emissions trading

Outcomes from carbon offsetting actions or emissions trading (whether or not under the EU ETS) shall not be taken into account for calculation and declaration of energy consumption and GHG emissions in transport services.

5 Principles of calculation of energy consumption and GHG emissions in transport services

5.1 General objectives

Calculation shall take into account:

— all vehicles used to perform the transport service, including those operated by subcontractors;

— all fuel consumption from each energy carrier used by each vehicle;

— all loaded and empty trips made by each vehicle.

EXAMPLE For the following vehicles using two different energy carriers, both energy carriers are taken into account for the calculation: road vehicle using LPG and gasoline, road vehicle using electricity and gasoline (plug in), ship using HFO (heavy fuel oil) and MDO (marine diesel oil).

Calculation shall produce the four following results:

— well-to-wheels energy consumption (E_w);

— well-to-wheels GHG emissions (G_w);

— tank-to-wheels energy consumption (E_t);

— tank-to-wheels GHG emissions (G_t).