



SLOVENSKI STANDARD
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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 on energy consumptions and GHG emissions in transport services (good and passengers transport)

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 (passagers et marchandises)

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**Methodology for calculation and declaration on energy
consumptions and GHG emissions in transport services (good
and passengers transport)**

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
marchandises)

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

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: Avenue Marnix 17, B-1000 Brussels

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prEN 16258:2011 (E)

Foreword

This document (prEN 16258:2011) has been prepared by Technical Committee CEN/TC 320 "Transport - Logistics and services", the secretariat of which is held by NEN.

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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 the 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 the vehicle's energy processes (exploitation, 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 the preparation of this standard seeks 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, ensures declarations have greater consistency and transparency, and fully allocates energy and emissions to a vehicle's payload.

It is anticipated that future editions of the standard may have a broader scope boundary, to include additional aspects such as, transport terminals, transshipment activities, and other phases of the lifecycle.

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1 Scope

This standard establishes a common methodology for the calculation, declaration and reporting on energy use and greenhouse gas (GHG) emissions related to a transport service (of goods, passengers or both).

It specifies guidelines, general principles, definitions, system boundaries, calculation methods, apportionment rules (allocation) and data recommendations, with the objective to promote standardized, accurate, credible and verifiable declarations, regarding energy use and GHG emissions related to any transport service quantified.

Potential users of this standard are any person or organisation who needs to refer to a standardized methodology when communicating the results of the quantification of a transport service, especially:

- Transport service operators (freight or passengers carriers);
- Transport service organizers (carriers subcontracting transport operations, freight forwarders and travel agencies);
- Transport services buyers (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

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

[ISO 14064-1:2006 modified]

NOTE 1 In this standard, GHGs are limited to, carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulfur hexafluoride (SF₆).

2.1.2

global warming potential **GWP**

factor describing the radiative forcing impact of one mass-based unit of a given GHG relative to an equivalent unit of carbon dioxide over a given period of time

[ISO 14064-1:2006]

2.1.3

carbon dioxide equivalent **CO₂e**

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

[ISO 14064-1:2006]

NOTE The carbon dioxide equivalent is calculated using the mass of a given GHG multiplied by its global warming potential

2.1.4**carbon offsetting**

avoiding GHG emissions somewhere in order to compensate emissions occurred elsewhere

2.1.5**GHG emissions conversion factor**

factor to be applied to a quantity of energy carrier considered, for calculation of the quantity of GHG related to the use of this energy carrier

2.1.6**energy**

electricity, fuel, steam, heat, compressed air and other like media

NOTE Energy is an abstract concept. The international unit for energy is Joule (J).

[EN 16001:2009]

2.1.7**energy use**

manner or kind of application of energy

EXAMPLES Vehicle propulsion, ventilation, heating

NOTE The quantity of the energy applied is expressed as energy consumption.

[EN 16001:2009 modified]

2.1.8**energy consumption**

amount of energy used

NOTE 1 Energy consumption is a widely used term, although technically incorrect because energy is transformed or converted but cannot be consumed.

NOTE 2 The manner or kind of application of energy is expressed as energy use.

[EN 16001:2009]

2.1.9**energy carrier**

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

[ISO 13600:1997]

2.1.10**energy conversion factor**

factor to be applied to a quantity of energy carrier considered, for calculation of the quantity of energy related to the use of this energy carrier

2.1.11**fuel consumption**

quantity of energy carrier used at the level of the means of transport, no matter the nature of energy carrier is

NOTE 1 This definition includes all energy carriers, like electricity, for simplification reasons

NOTE 2 For rail transport using electric traction, the fuel consumption is the quantity of electricity collected from the contact lines by the vehicle's current collector

prEN 16258:2011 (E)**2.1.12****transport**

assisted movement of people and/or goods

[EN 14943:2005]

NOTE The term “transport” in general is used for movement supported by means.

2.1.13**means of transport**

particular vessel, vehicle, or other device used for the transport of goods and persons

[EN 14943:2005]

2.1.14**route**

1. (general) path (to be) taken to get from a starting point to a point of destination

2. (in forwarding) path along which goods are (to be) transported

[EN 14943:2005]

2.1.15**vehicle**

any kind of transport means, no matter the mode is

NOTE Within this standard, this definition includes vessels (watercraft, aircrafts like ships, boats, planes), for simplification reasons only

2.1.16**passenger****pax**

person carried in a vehicle, without participating in its operation

NOTE The term and its abbreviation are also used as a unit for quantity of passengers.

2.1.17**cargo**

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

[EN 14943:2005]

NOTE 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.

2.1.18**freight**

goods being transported from one location to another

[EN 14943:2005]

2.1.19**kilometre****km**

unit of distance

2.2 Specific terms

2.2.1

transport service

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

NOTE The beneficiary is named “transport service user”; see definition 2.2.5

2.2.2

leg (of a transport service)

for a transport service of a cargo or a passenger, section of the route taken within which the cargo or the passenger is carried on the same means of transport

2.2.3

transport service operator

entity who operates transport services

NOTE A transport service operator can be a passenger’s carrier (acting directly for passengers or as sub contractor of a transport service organizer), a freight carrier (acting directly for shippers or as sub contractor of a transport service organizer).

2.2.4

transport service organizer

entity who provides transport services that are subcontracted to another entity (transport service operator) who operates them

NOTE A transport service organizer can be a freight forwarder, an entity organizing trips/travel (e.g.: travel agency, tours operator), a local authority responsible of public passenger transport

2.2.5

transport service user

entity who buys a transport service

NOTE A transport service user can be a passenger, a shipper, or a transport service organizer (for the transport services sub contracted to transport service operators).

2.2.6

vehicle operation

functioning of one vehicle that is used for providing partially or totally one or more transport services for one or several beneficiaries

2.2.7

vehicles operations system

VOS

consistent set of vehicles operations established by the user of the standard according to its own criteria

NOTE These systems can be more or less wide. An example of a narrow VOS is a single operation of one vehicle between a loading point and an unloading point. An example of a wide VOS is the activity of the whole fleet of a transport operator over one year.

2.2.8

specific measured value

value measured specifically for the transport service for which the calculation is being performed

2.2.9

transport operator vehicle-type or route-type specific value

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

prEN 16258:2011 (E)**2.2.10****transport operator fleet value**

value established by the transport service operator on the basis of own measurements over a fleet

2.2.11**default value**

external value of the transport service operator

2.2.12**process**

activity using energy and/or emitting GHG

2.2.13**vehicle process**

process taking place at the local level of a vehicle, corresponding to operation of main engines (for propulsion) and auxiliary engines (like thermo equipment) of the vehicle

NOTE Within this standard, vehicle processes do not include all processes at the vehicle level. Examples of not included processes: leakages of GHG that are not due to engine combustion, assistance to the vehicle with other devices like tugboats for towing vessels in harbours and aircrafts tractors for planes in airports. See Clause 4.

2.2.14**energy process**

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

NOTE 1 These processes can be, for fuels, extraction, cultivation, 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 2 "Operational" means that only a part of the processes taking place upstream of the local level of the vehicle is included. Examples of non-included processes are: 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.

NOTE 3 Within this standard, the objective is to take into account the total operational upstream processes for each energy carrier. Careful use of European Directives on fuels and electricity like Directive 2009/30/EC on Fuel Quality and Directive 2009/72/EC on internal market in electricity can assist in meeting this objective. In this context it has to be pointed out that calculations done in accordance with Directive 2009/72/EC could include only the upstream processes from power plants to the customer.

2.2.15**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)

2.2.16**shortest feasible distance**

distance actually achievable by the shortest route, with the transport solution considered

2.2.17**load**

quantity or nature of whatever is being carried by a means of transport

2.2.18**load factor**

ratio of the actual load and the available capacity of one means of transport

2.2.19

empty trip

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

2.2.20

traffic

transport activity

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2.3 Alphabetical index of terms and corresponding abbreviations

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3 Units and symbols

3.1 Energy

Quantities of energy shall be expressed in joule (J).

3.2 GHG emissions

Quantities of GHG emissions shall be expressed in kilogram (kg) of carbon dioxide equivalent (CO₂e).

4 Quantification boundaries

4.1 Processes included

The calculation of energy consumption and greenhouse gas emissions in transport services shall only include the following two processes¹⁾:

- Vehicle processes;
- Energy processes.

Energy processes shall include all operational processes like:

- For fuels: extraction, cultivation, 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.

The corresponding quantifications and results shall be qualified using the following terms:

- Tank-to-Wheels (noted TTW), for vehicle processes;
- Well-to-Tank (noted WTT), for energy processes;
- Well-to-Wheels (noted WTW), for both vehicle and energy processes.

4.2 Processes not included

The results calculated in accordance with this standard shall not include, in particular:

- Non operational processes at the vehicle level, like emissions of GHG that are not due to engine combustion (leakages in particular);
- Processes consisting of short-term assistance to the vehicle for security of movement reasons, with other devices like tugboats for towing vessels in harbours, aircrafts tractors for planes in airports, etc;
- Processes for the movement or transshipments of cargo, the movement of passengers, that are not implemented by vehicles, but by external handling or transshipment devices (for freight), or external movement devices (for passengers). In express delivery services and other transport services organized 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 organizations involved in the transport services. Theses processes can be operation of buildings, personnel movement, computer systems, etc;
- Processes for the construction, maintenance, and scrapping of vehicles;

1) Cf. definitions in clause 2