



BSI Standards Publication

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

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National foreword

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A list of organizations represented on this committee can be obtained on request to its secretary.

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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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Management Centre: Avenue Marnix 17, B-1000 Brussels

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Contents

Page

Foreword.....	4
Introduction	5
1 Scope	6
2 Terms, definitions and abbreviations	6
2.1 General terms.....	6
2.2 Specific terms	9
3 Units and symbols	11
3.1 Energy	11
3.2 GHG emissions	11
4 Quantification boundaries	12
4.1 General.....	12
4.2 Processes included	12
4.3 Processes not included	12
4.4 Greenhouse gases.....	13
4.5 Carbon offsetting and emissions trading	13
5 Principles of calculation of energy consumption and GHG emissions in transport services.....	13
5.1 General objectives	13
5.2 Steps of the calculation of energy consumption and GHG emissions of one transport service.....	14
5.3 Sub steps for the calculation of energy consumption and GHG emissions of one leg of one transport service	14
5.4 Categories of values used for the calculation	14
5.4.1 General.....	14
5.4.2 Use of default values	15
6 Principles of identification of the different legs of a transport service	15
7 Principles of the calculation at the vehicle operation system (VOS) level.....	15
7.1 General.....	15
7.2 Sub step 2.1: Establishing the VOS related to the leg	15
7.3 Sub step 2.2: Quantification of the total fuel consumption for the VOS.....	16
7.4 Sub step 2.3: Calculation of total energy consumption and GHG emissions for the VOS	16
8 Principles of allocation to cargo and/or passengers	17
8.1 General.....	17
8.2 Basic principles	18
8.3 Allocation parameters and units	18
8.3.1 General.....	18
8.3.2 Allocation for passengers.....	18
8.3.3 Allocation for freight	18
8.3.4 Combined transport of passengers and freight	19
8.4 Data collecting	20
9 Principles of summing the results for each leg.....	20
10 Declaration	20
10.1 General.....	20
10.2 Possibility to make a short declaration	21
10.3 Supporting information	21
10.3.1 General statement.....	21

10.3.2	Transparent description of the method	21
Annex A	(normative) Energy and GHG emission factors	23
A.1	Transport fuels	23
A.1.1	General	23
A.1.2	Consistency between sources	23
A.1.3	Table of energy and GHG emission factors.....	23
A.1.4	Biofuel Blends	25
A.1.5	Specified fuels	28
A.2	Electricity.....	28
A.2.1	Well-to-wheels energy factors.....	28
A.2.2	Well-to-wheels emission factors.....	28
A.2.3	Tank-to-wheels energy factor.....	29
A.2.4	Tank-to-wheels emission factor.....	29
Annex B	(normative) Allocation methods for ferries (maritime transport)	30
B.1	General	30
B.2	Mass method.....	30
B.3	Area method.....	31
B.4	Default values	31
Annex C	(informative) Inclusion of empty trips into a VOS.....	32
C.1	General	32
C.2	Example for a simple case.....	32
C.3	Example of a VOS for a distribution or collection round trip.	33
Annex D	(informative) Template for declaration of categories of values used	34
Annex E	(informative) Example for passengers: transport service by bus	35
E.1	Description of the example.....	35
E.2	Example with use of specific measured values	36
E.3	Example with use of transport operator fleet values.....	37
E.4	Example with use of default values	38
E.5	Example with use of transport operator specific values.....	38
E.6	Overview of the results	39
Annex F	(informative) Examples for freight	40
F.1	Transport service of freight transport by train.....	40
F.1.1	Description of the example.....	40
F.1.2	Example with use of specific measured values	41
F.1.3	Example with use of transport operator specific values.....	42
F.1.4	Examples with use of default values	43
F.1.5	Overview of the results	45
F.2	Transport service of freight transport by container ship.....	45
F.2.1	Description of the example.....	45
F.2.2	Example with use of specific measured values	46
F.2.3	Example with use of default values	47
F.2.4	Overview of the results	48
Annex G	(informative) Example for combined passenger and freight transport: ferry lines.....	49
G.1	Description of the example.....	49
G.2	Results and comparison of the two allocation methods.....	49
Annex H	(informative) Detailed sources used and calculations done for establishment of Table	
A.1		51
Annex I	(informative) Example of available sources of default values	65
Bibliography		66

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.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

According to the CEN/CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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, transshipment 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

CO₂e

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 (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulfur hexafluoride (SF₆). 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 (CO₂e) or multiples thereof such as kilogram (kg) or tonne (t) of CO₂e.

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 transshipment 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 CO₂ 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 transshipment devices (for freight), or by external movement devices (for passengers, like elevators and moving walkways), for the movement or transshipments 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 (CO₂), methane (CH₄), nitrous oxide (N₂O), hydro fluorocarbons (HFCs), per fluorocarbons (PFCs) and sulphur hexafluoride (SF₆). 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).

5.2 Steps of the calculation of energy consumption and GHG emissions of one transport service

Calculation for one given transport service shall be implemented through the following three main steps:

- step 1: Identification of the different legs of this transport service (see Clause 6);
- step 2: Calculation of energy consumption and GHG emissions of each leg (see corresponding sub steps in 5.3);
- step 3: Sum of the results for each leg (see Clause 9).

5.3 Sub steps for the calculation of energy consumption and GHG emissions of one leg of one transport service

Calculation for one leg of one transport service shall be implemented through the following four main sub steps:

- sub step 2.1: Establishing the vehicle operation system (VOS) related to this leg;
- sub step 2.2: Quantification of the total fuel consumption for this VOS;
- sub step 2.3: Calculation of total energy consumption and GHG emissions for this VOS;
- sub step 2.4: Allocation to the leg of a share of each of the four results of sub step 2.3.

Sub steps 2.1, 2.2 and 2.3 shall be undertaken according to Clause 7.

Sub step 2.4 shall be undertaken according to Clause 8.

5.4 Categories of values used for the calculation

5.4.1 General

Calculations explained further on in this standard require using data related to the operational characteristics of the transport service and the vehicles used to achieve the legs. These characteristics can be, for example:

- fuel consumption;
- distance;
- fuel consumption per distance;
- load;
- load factor;
- vehicle capacity;
- empty distance.

NOTE Energy and GHG emission factors are not operational characteristics and so are not concerned by this subclause.

The values selected for these operational characteristics shall be determined in accordance with this standard and shall belong to the following categories of values, given by order of preference:

- specific measured values;
- transport operator specific values;
- transport operator fleet values;
- default values.

For the use of default values, 5.4.2 shall be followed.

NOTE 1 A mix of these values categories can be used.

NOTE 2 Examples of calculations with the use of the different categories of values are given in Annexes E, F and G.

5.4.2 Use of default values

Default values should be taken from a published documentation. The last available version should be used.

Default values should be relevant to the operation for which the calculation is being performed.

6 Principles of identification of the different legs of a transport service

The transport service to be quantified shall be analysed in regards to the different vehicles that carry the cargo and / or the passenger successively.

Step 1 as described in 5.2 shall be implemented by associating each section of the route using the same vehicle to a leg of the transport service.

EXAMPLE If a passenger firstly takes a bus, then a metro and finally a second bus, with the same ticket, the corresponding transport service is composed of three legs.

7 Principles of the calculation at the vehicle operation system (VOS) level

7.1 General

Clause 7 provides principles for the first three sub steps (2.1, 2.2 and 2.3) of the calculation for one leg. These three sub steps correspond to the calculation at the VOS level.

7.2 Sub step 2.1: Establishing the VOS related to the leg

The calculation of any leg of a transport service shall start with the selection of a VOS related to this leg.

As a minimum requirement, this VOS shall be a consistent set of vehicle operations relevant to the leg being calculated.

When establishing the VOS, consideration should be given to factors which affect the scale and composition of the VOS such as:

- number and type of vehicles to be included;
- period of time of activity of these vehicles.

The VOS may be chosen according to the criteria chosen by the user of this standard.

In all cases, the VOS shall include the empty trips related to the vehicle operations.

NOTE Annex C gives examples showing the inclusion of empty trips into a VOS.

EXAMPLE 1 The whole activity of the fleet of a transport operator over one year can be the VOS for all legs performed by this fleet.

EXAMPLE 2 If the leg is a part of a container ship line, the VOS related to this leg can be the whole ship line.

EXAMPLE 3 If the leg is included in a collection and/or delivery round trip, the VOS related to this leg can be this collection/delivery round trip.

EXAMPLE 4 If the leg is a trip of a passenger in a public transport bus, the VOS related to this leg can be the whole bus line from starting point to the ending point. It is also possible to choose the whole bus network.

7.3 Sub step 2.2: Quantification of the total fuel consumption for the VOS

Quantification of the total fuel consumption for the VOS shall be undertaken using the categories of values listed in 5.4.

In the cases for which the vehicles use different energy carriers, total fuel consumptions shall be quantified separately for each energy carrier used.

7.4 Sub step 2.3: Calculation of total energy consumption and GHG emissions for the VOS

Conversion from total fuel consumption for the VOS into quantities of energy consumption and GHG emissions shall be made using following formulas:

— for well-to-wheels energy consumption of the VOS:

$$E_w(\text{VOS}) = F(\text{VOS}) \times e_w \quad (1)$$

— for well-to-wheels GHG emissions of the VOS:

$$G_w(\text{VOS}) = F(\text{VOS}) \times g_w \quad (2)$$

— for tank-to-wheels energy consumption of the VOS:

$$E_t(\text{VOS}) = F(\text{VOS}) \times e_t \quad (3)$$

— for tank-to-wheels GHG emissions of the VOS:

$$G_t(\text{VOS}) = F(\text{VOS}) \times g_t \quad (4)$$

where

$F(\text{VOS})$ is the total fuel consumption used for the VOS (examples: $F(\text{VOS})$ equals five thousand litres of diesel; or $F(\text{VOS})$ equals thirty thousand kilowatt hours);

e_w is the well-to-wheels energy factor for the fuel used (example: for diesel, $e_w = 42,7 \text{ MJ/l}$);

- g_w is the well-to-wheels GHG emission factor for the fuel used (example: for diesel, $g_w = 3,24 \text{ kgCO}_2\text{e/l}$);
- e_t is the tank-to-wheels energy factor for the fuel used (example: for diesel, $e_t = 35,9 \text{ MJ/l}$);
- g_t is the tank-to-wheels GHG emission factor for the fuel used (example: for diesel, $g_t = 2,67 \text{ kgCO}_2\text{e/l}$).

Values for energy and GHG emission factors shall be selected in accordance with Annex A.

If the vehicles use different energy carriers within the VOS, the several fuel consumptions quantified in sub step 2.2 shall be separately converted into energy consumption and GHG emissions, and then added together.

8 Principles of allocation to cargo and/or passengers

8.1 General

This clause sets out requirements for the fourth sub step (2.4) for the calculation for one leg.

After sub steps 2.1, 2.2 and 2.3 are done, the leg of the transport service shall be allocated a share of $E_w(\text{VOS})$, $G_w(\text{VOS})$, $E_t(\text{VOS})$, $G_t(\text{VOS})$, corresponding to its relative share of the transport activity performed within the VOS.

Corresponding formulas are:

$$S(\text{leg}) = T(\text{leg}) \div T(\text{VOS}) \quad (5)$$

$$E_w(\text{leg}) = E_w(\text{VOS}) \times S(\text{leg}) \quad (6)$$

$$G_w(\text{leg}) = G_w(\text{VOS}) \times S(\text{leg}) \quad (7)$$

$$E_t(\text{leg}) = E_t(\text{VOS}) \times S(\text{leg}) \quad (8)$$

$$G_t(\text{leg}) = G_t(\text{VOS}) \times S(\text{leg}) \quad (9)$$

where

$S(\text{leg})$ is the factor used to calculate the share of the VOS's energy and emissions which is allocated to a transport service for the leg. This share is based on relative proportions of transport activity for the leg and for the associated VOS;

$T(\text{leg})$ is the transport service's transport activity for the leg ;

$T(\text{VOS})$ is the transport activity of the VOS which is related to the leg (see 7.2);

$T(\text{leg})$ and $T(\text{VOS})$ shall have the same allocations parameters and units, and are to be determined according to 8.3.

NOTE As Clause 8 presents different possibilities of apportionment, Clause 10 specifies that choices made by the user regarding allocation methods will be declared and justified.

8.2 Basic principles

All energy consumption and GHG emissions of the vehicle operation shall be allocated to the corresponding cargo and/or passengers carried.

No marginal accounting shall be carried out for any cargo or passenger carried.

The allocation parameters and units used shall remain consistent over time, as appropriate.

Only one allocation method shall be used for all the cargo and/or passengers within the same VOS.

8.3 Allocation parameters and units

8.3.1 General

The allocation parameter shall be the transport activity.

8.3.2 Allocation for passengers

8.3.2.1 General

The transport activity should be quantified by multiplying the quantity of passengers by the distance travelled.

The quantity of passengers should be the number of passengers.

The distance travelled should be the real distance travelled.

If distance is used in aviation, it shall be the Great Circle Distance plus 95 kilometres.

Therefore, the allocation parameter should be the product of the number of passengers by the real distance travelled.

The corresponding allocation unit is passenger kilometre (pax.km)

8.3.2.2 Other parameters and units

Other allocation parameters may be the transport activity measured with the number of passengers or number of trips.

8.3.3 Allocation for freight

8.3.3.1 General

The transport activity should be quantified by multiplying the quantity of freight by the distance travelled.

The quantity of freight shall be characterised by the cargo being carried, including any packaging, container, and means of handling or transport except those that are not part of the shipment.

EXAMPLE 1 For a cargo carried on pallets, the quantity of freight includes the pallets.

EXAMPLE 2 For a cargo carried on a truck that uses a Roll-On Roll-Off maritime transport service, the quantity of freight corresponds to the truck and its cargo and not just to the cargo inside the truck.

EXAMPLE 3 For a cargo carried on a train in a swap body in combined rail road transport, the quantity of freight corresponds to the swap body and its cargo.

EXAMPLE 4 For a cargo carried on pallets on a train, the quantity of freight corresponds to the cargo including the pallets.

EXAMPLE 5 For a cargo that is bundled by the transport service organiser or transport service operator to allow for easy handling (e.g. on a pallet or in a container), the quantity of freight does not include the cargo carrier.

The unit for quantity of freight should be the mass.

The distance travelled should be the real distance travelled, except for collection and distribution round trips (as specified in 8.3.3.3).

If distance is used in aviation, it shall be the Great Circle Distance plus 95 kilometres.

Therefore, the allocation parameter should be the product of the mass by the real distance travelled.

Corresponding allocation unit is tonne kilometre (t.km).

8.3.3.2 Other parameters and units

As the parameter for quantity of freight, mass may be replaced by another unit, especially if it is more relevant to the vehicle's capacity limit, like volume, pallet, parcel, Twenty-foot Equivalent Unit (TEU), lane meter, etc.

Other allocation parameters may also be the transport activity expressed in:

- either quantity of freight only, represented by mass or other parameter like volume, etc; corresponding units are tonne, cubic metre (m³), etc.;
- or quantity of distance only, represented by real distance travelled or, for round trips, Great Circle Distance or shortest feasible distance; corresponding unit is kilometre (km).

8.3.3.3 Collection and distribution round trips

Concerning the distance travelled, one of the two following options should be taken:

- use of the Great Circle Distance;
- use of the shortest feasible distance.

8.3.4 Combined transport of passengers and freight

8.3.4.1 Air transport

The transport activity shall be quantified by multiplying the mass of passengers and freight by the distance travelled.

The total mass shall be the sum of:

- a) mass of freight;
- b) mass of passengers calculated with, by order of preference: