DOCUMENTATION FOR TRUCK TRANSPORT PROCESSES

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General Description of Processes

This documentation describes transportation processes for utility vehicles for the transportation of cargo in [kg]. The processes comprise the use phase with fuel demand and emissions released. The default functional unit is the transportation of 1 kg of cargo over a distance of 100 km. The following parameters are variable: distance, utilisation ratio / load, share of road categories (urban/rural/motorway) and, if required, sulfur content in fuel and total payload.

Process Characterization / Abbreviations / Naming

General process naming:

Size Category with Total Capacity / Payload / Emission Category

- Truck = single truck without trailer
- Truck Trailer = truck and trailer combination
- Gross weight = total weight
- Payload capacity = vehicle load capacity

A list of all available processes is appended at the end of this documentation.

Classification into

- Size Categories (see [7], [8], [11])
  - Truck-trailer < 28 t
  - Truck-trailer 28-34 t
  - Truck-trailer 34-40 t
  - Truck < 7.5 t
  - Truck 7.5-12 t
  - Truck 12-14 t
  - Truck 14-20 t
  - Truck 20-26 t
  - Truck 26-28 t
  - Truck 28-32 t
  - Truck > 32 t

- Emission Categories (see [3], [11])
  - Average 1980s (pre-Euro)
  - Euro 1
  - Euro 2
  - Euro 3
  - Euro 4
  - Euro 5
  - Mix Euro 0-5
Road Categories (see [11])

- Average Motorway (MW)
- Average Rural (RU)
- Average Urban (UR)

Emissions Calculation

The emission calculations are derived from emission factors from literature (HBEFA) [11] which are based on measurements. Additional calculation principles are elucidated below.

General Emissions Calculation

With the assumption that the utilisation ratio (load) behaves linearly (see [2]), the Emissions Factors (EF) [g/km] are referenced to 1 kg of cargo via the following equation:

\[
\text{EF}_{\text{empty}} \cdot \text{Utilisation} \cdot \text{Payload} \cdot 1000 \cdot \text{EF}_{\text{loaded}} - \text{EF}_{\text{empty}} \cdot \text{Utilisation} \cdot \text{EF}_{\text{empty}} \cdot \text{Utilisation} \cdot \text{EF}_{\text{empty}} = \frac{g}{km \cdot kg}
\]

\[(1)\]

\(\text{EF}_{\text{empty}}\) Emission factor for empty run [g/km]

\(\text{EF}_{\text{loaded}}\) Emission factor for loaded run [g/km]

\(\text{Utilisation}\) Utilisation ration (load factor) referred to mass [-]

\(\text{Payload}\) Maximum payload capacity [t]

The payload and utilisation ratio are variable parameters that can be set individually by the user. The variable parameters payload and utilisation can be specified within the process and set individually by the user.

The total emissions for each pollutant refer to 1 kg cargo and the transportation distance is to be calculated based on the driving share (Motorway = MW\(_{\text{share}}\), Rural = RU\(_{\text{share}}\), Urban = UR\(_{\text{share}}\)) [\%], the specific emissions (Motorway = MW\(_{\text{Em}}\), Rural = RU\(_{\text{Em}}\), Urban = UR\(_{\text{Em}}\)) in [g/(km*kg)] and the distance [km].

\[
\text{Total Emission}_x = \left[ (\text{MW}_{\text{share}} \cdot \text{MW}_{\text{Em}}) + (\text{RU}_{\text{share}} \cdot \text{RU}_{\text{Em}}) + (\text{UR}_{\text{share}} \cdot \text{UR}_{\text{Em}}) \right] \cdot \text{distance}
\]

\[(2)\]

\(x\) Index for a specific pollutant [-]

\(\text{MW}_{\text{share}}\) Driving share on motorway [%]

\(\text{MW}_{\text{Em}}\) Motorway specific emissions [g/(km*kg)]

\(\text{RU}_{\text{share}}\) Driving share on rural road [%]

\(\text{RU}_{\text{Em}}\) Rural specific emissions [g/(km*kg)]

\(\text{UR}_{\text{share}}\) Driving share on urban road [%]

\(\text{UR}_{\text{Em}}\) Urban road specific emissions [g/(km*kg)]

Singularity for CO\(_2\)

The calculations for carbon dioxide emissions are based on the emission factors according to equations (1) and (2), whereas a constant relation of 3.175 kg\(_{\text{CO2}}\)/kg\(_{\text{Diesel}}\)
for the fuel consumption is assumed. With a medium density of 0.832 kg/l (diesel) this is equal to a ratio of 2,642 kgCO₂/lDiesel.

Calculation of SO₂
For sulfur dioxide, a complete stoichiometric conversion of the sulfur contained in the fuel and of oxygen into SO₂ is assumed. The sulfur content in the fuel is a variable parameter, which can be set individually by the user.

\[
S + O₂ \rightarrow SO₂
\]

\[
EF_{SO₂} = \frac{x_{ppm_s}}{1000000} \frac{kg_s}{kg_{Diesel}} \cdot \frac{64 g_{SO₂}}{32 g_s} \cdot Diesel\_Consumption \frac{kg_{Diesel}}{kg_{Cargo}} \left( \frac{kg_{SO₂}}{kg_{Cargo}} \right)
\]

\[\text{(3)}\]

\(EF_{SO₂}\) Emission factor for SO₂

\(x_{ppm_s}\) Mass share of sulfur in fuel

Laughing Gas (N₂O) and Ammonia (NH₃)
The emission factor for laughing gas (nitrous oxide, N₂O) is assumed to be constant for each emission category and each road category. The emission factor for ammonia (NH₃) is set as constant throughout all categories.

Variable Parameters

<table>
<thead>
<tr>
<th>Parameter Name</th>
<th>Comment</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>share_MW</td>
<td>Driving share on motorway (MW)</td>
<td>-</td>
</tr>
<tr>
<td>share_RU</td>
<td>Driving share rural (RU)</td>
<td>-</td>
</tr>
<tr>
<td>share_UR</td>
<td>Driving share urban (UR)</td>
<td>-</td>
</tr>
<tr>
<td>utilisation</td>
<td>Utilisation ratio or load factor based on mass</td>
<td>-</td>
</tr>
<tr>
<td>distance</td>
<td>Distance from start to end</td>
<td>km</td>
</tr>
<tr>
<td>payload</td>
<td>Maximum payload capacity</td>
<td>t</td>
</tr>
<tr>
<td>ppm_sulfur</td>
<td>Mass share of sulfur in fuel</td>
<td>ppm</td>
</tr>
<tr>
<td>share_CO₂_bio</td>
<td>Share of biogenic C in fuel</td>
<td>-</td>
</tr>
</tbody>
</table>

Inputs

Valuable Substances

<table>
<thead>
<tr>
<th>Flow</th>
<th>Flow Group</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diesel</td>
<td>Crude Oil Products</td>
<td>kg</td>
</tr>
<tr>
<td>Cargo</td>
<td>Others</td>
<td>kg</td>
</tr>
</tbody>
</table>
Outputs

Valuable Substances

<table>
<thead>
<tr>
<th>Flow</th>
<th>Flow Group</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cargo</td>
<td>Others</td>
<td>kg</td>
</tr>
</tbody>
</table>

Emissions

<table>
<thead>
<tr>
<th>Flow</th>
<th>Flow Group</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammonia</td>
<td>Inorganic Emissions to Air</td>
<td>kg</td>
</tr>
<tr>
<td>Benzene</td>
<td>Group NMVOC to Air</td>
<td>kg</td>
</tr>
<tr>
<td>Carbon Dioxide</td>
<td>Inorganic Emissions to Air</td>
<td>kg</td>
</tr>
<tr>
<td>Carbon Dioxide (biotic)</td>
<td>Inorganic Emissions to Air</td>
<td>kg</td>
</tr>
<tr>
<td>Carbon Monoxide</td>
<td>Inorganic Emissions to Air</td>
<td>kg</td>
</tr>
<tr>
<td>Dust (PM2.5)</td>
<td>Particles to Air</td>
<td>kg</td>
</tr>
<tr>
<td>Methane</td>
<td>Organic Emissions to Air (Group VOC)</td>
<td>kg</td>
</tr>
<tr>
<td>Nitrogen Dioxide</td>
<td>Inorganic Emissions to Air</td>
<td>kg</td>
</tr>
<tr>
<td>Nitrogen Monoxide</td>
<td>Inorganic Emissions to Air</td>
<td>kg</td>
</tr>
<tr>
<td>Nitrous Oxide (Laughing Gas)</td>
<td>Inorganic Emissions to Air</td>
<td>kg</td>
</tr>
<tr>
<td>NMVOC (unspecific)</td>
<td>Group NMVOC to Air</td>
<td>kg</td>
</tr>
<tr>
<td>Sulfur Dioxide</td>
<td>Inorganic Emissions to Air</td>
<td>kg</td>
</tr>
</tbody>
</table>

Systems and Emissions that are not considered

- Vehicle production
- Vehicle recycling
- Infrastructure (roads/...)
- Noise
- Diurnal losses and refueling losses (see [12])
- Hot-Soak-Emissions
- Oil use
- Cold-Start Emissions
- Emissions from air conditioning (relevance < 1 %, see [9])
- Abrasion of tyres and brakes

Application

Input Parameters

The truck processes can be adapted to specific conditions by means of the variable parameters.
Distance
The distance represents the real driven distance of the truck from start to end. This should be modified by the user.

Load based on Mass (parameter: utilisation)
The standard utilisation ratio (or load based on mass) is assumed to be 85% [4]. This factor represents the relation of transported cargo to payload capacity. For hauler services in Europe the value is 0.85 (= 85 %) [1]. If cargo with low density is transported (e.g. expanded polystyrene or foam materials), the load factor should be adapted (reduced) accordingly. Only load factor values > 0 and ≤ 1 are permitted!
Minimum value: “utilisation” = \(1/\text{payload} \text{[kg]}\) (equal to empty run)
Maximum value: “utilisation” = 1 (equal to full load)

Payload
The payload of a truck is the total weight minus the actual weight of the vehicle and is equal to the vehicle load capacity [t]. The predefined standard value represents the typical situation in each case, in accordance with the transportation process name. In special cases, trucks with superstructures that are particularly heavy (e.g. a refrigeration unit) or particularly light (e.g. a simple platform) can be represented by adjusting this parameter.

Sulfur Content of Fuel (parameter: “ppm_sulfur”)
The sulfur content in diesel fuel varies strongly worldwide; the transport processes can be adapted accordingly. The following table shows possible values.

<table>
<thead>
<tr>
<th>Country</th>
<th>Sulfur Content by mass [ppm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>EU</td>
<td>standard: 10 ppm</td>
</tr>
<tr>
<td></td>
<td>from 2005 Diesel with &lt; 10 ppm available</td>
</tr>
<tr>
<td></td>
<td>from 2009 Diesel with &lt; 10 ppm obligatory [5]</td>
</tr>
<tr>
<td>Germany, Sweden</td>
<td>10 ppm (since 2003)</td>
</tr>
<tr>
<td>Japan</td>
<td>500 ppm, from end of 2004: 50 ppm</td>
</tr>
<tr>
<td>China</td>
<td>up to 2000 ppm</td>
</tr>
<tr>
<td>Indonesia, Singapore, Pakistan</td>
<td>up to 5000 ppm</td>
</tr>
<tr>
<td>India, Philippines, Thailand</td>
<td>up to 500 ppm</td>
</tr>
<tr>
<td>Australia</td>
<td>up to 5000 ppm, from 2007: 50 ppm</td>
</tr>
<tr>
<td>Latin America (general)</td>
<td>&gt; 2500 ppm</td>
</tr>
<tr>
<td>Brasilia</td>
<td>up to 10000 ppm</td>
</tr>
<tr>
<td>USA</td>
<td>up to 500 ppm, from mid of 2006: 15 ppm</td>
</tr>
<tr>
<td>Canada</td>
<td>500 ppm</td>
</tr>
<tr>
<td>South Africa</td>
<td>&lt; 3000 ppm</td>
</tr>
</tbody>
</table>
Driving Shares for Motorway, Rural, Urban (respective parameters: “share_mw”, “share_ru”, “share_ur”)  

The driving shares for Motorway (MW), Rural (RU), Urban (UR) can be adapted to specific boundary conditions. The predefined standard values represent the shares for Germany for the respective vehicle. In addition, the shares must be 1 total.

Empty Run  

When considering an empty run, the process provides emissions according to the empty run Emission Factors EF_{empty} [g/km] without carrying cargo. In a GaBi model, this situation can be modeled with a fixed and non-connected transport process in the transport chain. The following conditions for parameters must be applied:

\[ \text{load} \rightarrow 0 \quad \text{(4)} \]

\[ \text{load} \cdot \text{payload} = \text{tonnage} = \text{scaling factor} \cdot \text{cargo} \quad \text{(5)} \]

As load = 0 is an invalid value, values have to be applied according to the following example.

Example: empty run for “Truck-trailer > 34 - 40 t total cap. / 27 t payload / Euro 3”

- fixing to scaling factor = 1, therewith tonnage = 1 kg
- with payload = 27 t = 27000 kg the load is calculated to = 1/27000 = 3,7037*10^{-5}.

Forward and Return Trips with different Loads

If the forward trip and return trip are driven with different loads the average load can be calculated as follows:

\[
\text{load} = \frac{\text{distance}_{\text{trip}} \cdot \text{load}_{\text{trip}} + \text{distance}_{\text{return}} \cdot \text{load}_{\text{return}}}{\text{distance}_{\text{trip}} + \text{distance}_{\text{return}}} \quad \text{(6)}
\]

\[
\text{distance} = \text{distance}_{\text{trip}} + \text{distance}_{\text{return}} \quad \text{(7)}
\]

If the return trip is an empty run, the calculation can be approximated with: \( \text{load}_{\text{return}} = 0 \).

Transport of specifically lightweight goods

In case of transportation of specifically lightweight goods, the standard utilisation ratio has to be reduced.

Example: transport of expanded polystyrene (EPS), density 20 kg/m³, with truck-trailer 40 t total cap. / 27 t payload /. 90 m³ volume capacity

- good has to be identified as specifically lightweight good (low density, high air content)
max utilisation $1.8 \text{ t} < \text{payload 27 t}$; volume capacity reached before weight capacity; utilisation ratio has to be reduced

new load factor $\frac{\text{utilisation}}{\text{payload capacity}} = \frac{1.8t}{27t} \approx 0.07 \text{ (7%)}$ instead of 85%

**Choice of correct truck**

To choose the correct truck the following aspects have to be considered:

- the total weight of the truck

<table>
<thead>
<tr>
<th>total weight</th>
<th>comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Truck-trailer &lt; 28 t</td>
<td>medium to heavy-duty national and international long-haul transport</td>
</tr>
<tr>
<td>Truck-trailer 28-34 t</td>
<td>heavy-duty national and international long-haul transport</td>
</tr>
<tr>
<td>Truck-trailer 34-40 t</td>
<td>heavy duty long-haul transports, tanks</td>
</tr>
<tr>
<td>Truck &lt; 7.5 t</td>
<td>van or very small truck</td>
</tr>
<tr>
<td>Truck 7.5-12 t</td>
<td>small truck for short-haul and distribution transport</td>
</tr>
<tr>
<td>Truck 12-14 t</td>
<td>medium truck for short-haul and distribution transport</td>
</tr>
<tr>
<td>Truck 14-20 t</td>
<td>medium truck for short-haul and distribution transport</td>
</tr>
<tr>
<td>Truck 20-26 t</td>
<td>heavy-duty national and international long-haul transport</td>
</tr>
</tbody>
</table>
The emission classes from ‘pre-Euro’ to ‘Euro 5’ are covered. The technologies are representative Europe-wide and can be adapted for worldwide locations with some minor restrictions. There is a need to identify the corresponding emission classes.

Spatial
The reference locations are Germany, Austria and Switzerland. However due to the similarity of the vehicle structures and the same emissions limit values, the models are representative for the entire EU. The model can be transferred to conditions in other countries worldwide with only some minor uncertainties. Note: impreciseness increases with the increase of deviation of the vehicle structure and with the road categories and the utilisation behavior – these can be adapted by modifying the driving share (MW/RU/UR) as well as the utilisation ratio and sulfur content in the fuel for individual conditions.

Temporal
The reference year of the data sets is 2010; representativeness may be assumed for the period of 2010 to 2015.

Modification of the age structure of vehicles for each emission class leads to changes in the emission profile. The validity of the data set is given for about 5 years (until 2015). Prognoses in HBEFA [11] based on comprehensive time series (1994-2020) report that there is no change in emission profiles within a certain size class, emissions
Parameter Variations – Examples
The following section shows some examples to highlight the influence of the single parameters.

Variation of Load
Figure 1 shows the specific carbon dioxide emission in \([\text{g CO}_2/(\text{kg Cargo}*\text{km})]\) for different truck sizes each driven on motorway (= highway) if the utilisation ratio (or load) is varied in equation (1).

![Graph showing variation of utilisation ratio between 1% und 100% (Standard 85%) Euro 3 / driving share 100% highway specific CO₂-emissions [gCO₂/(kgcargo*km)]](image)

Variation of utilisation ratio between 1% und 100% (Standard 85%)
Euro 3 / driving share 100% highway
specific CO₂-emissions [gCO₂/(kgcargo*km)]

Figure 1: Variation of utilisation ratio (load, based on mass) between 1 % and 100 %

With convergence to 0 % utilisation ratio (load), the specific emissions increase according to the mathematical function towards infinity (division by zero). The minimal utilisation ration (empty run) is the reciprocal value of the payload in [kg]. With a high load the specific emissions change only slightly.

Variation of Payload
Figure 2 shows the specific carbon dioxide emission in \([\text{g CO}_2/(\text{kg Cargo}*\text{km})]\) for different truck sizes each driven on motorway (= highway) if the payload is varied in equation (1).
Particularly for smaller trucks, a clear influence of variations in payload on CO₂-emissions, and therewith the fuel consumption, can be identified. If the truck has a lower payload caused by a heavy superstructure (e.g. a refrigeration unit), the specific emissions per kg of cargo increase.

**Variation of shares on different Road Categories**

Heavy trucks are optimised for rural and motorway travels (RU/MW) (see Figure 4), and therefore have the lowest specific emissions on motorway travel and clearly higher specific emissions in urban travel (see Figure 3 and Figure 5).

Small trucks have the lowest specific emissions in rural travel; the overall level of emissions is obviously higher than for heavy trucks (see Figure 3 / Figure 4 / Figure 5).
Figure 3: Specific Fuel Consumption
Urban – Rural

Figure 4: Specific Fuel Consumption
Rural – Motorway

Figure 5: Specific Fuel Consumption
Urban – Motorway
Literature


### Process List (GaBi)

**Global processes**

<table>
<thead>
<tr>
<th>region</th>
<th>name</th>
<th>standard</th>
<th>type</th>
<th>gross weight/payload</th>
</tr>
</thead>
<tbody>
<tr>
<td>GLO</td>
<td>Truck</td>
<td>diesel driven, 1980s, cargo</td>
<td>technology mix</td>
<td>up to 7.5t gross weight / 3,3t payload capacity</td>
</tr>
<tr>
<td>GLO</td>
<td>Truck</td>
<td>diesel driven, Euro 0 - 5 mix, cargo</td>
<td>technology mix</td>
<td>up to 7.5t gross weight / 3,3t payload capacity</td>
</tr>
<tr>
<td>GLO</td>
<td>Truck</td>
<td>diesel driven, Euro 1, cargo</td>
<td>technology mix</td>
<td>up to 7.5t gross weight / 3,3t payload capacity</td>
</tr>
<tr>
<td>GLO</td>
<td>Truck</td>
<td>diesel driven, Euro 2, cargo</td>
<td>technology mix</td>
<td>up to 7.5t gross weight / 3,3t payload capacity</td>
</tr>
<tr>
<td>GLO</td>
<td>Truck</td>
<td>diesel driven, Euro 3, cargo</td>
<td>technology mix</td>
<td>up to 7.5t gross weight / 3,3t payload capacity</td>
</tr>
<tr>
<td>GLO</td>
<td>Truck</td>
<td>diesel driven, Euro 4, cargo</td>
<td>technology mix</td>
<td>up to 7.5t gross weight / 3,3t payload capacity</td>
</tr>
<tr>
<td>GLO</td>
<td>Truck</td>
<td>diesel driven, Euro 5, cargo</td>
<td>technology mix</td>
<td>up to 7.5t gross weight / 3,3t payload capacity</td>
</tr>
<tr>
<td>GLO</td>
<td>Truck</td>
<td>diesel driven, 1980s, cargo</td>
<td>technology mix</td>
<td>7.5 t - 12t gross weight / 5t payload capacity</td>
</tr>
<tr>
<td>GLO</td>
<td>Truck</td>
<td>diesel driven, Euro 1, cargo</td>
<td>technology mix</td>
<td>7.5 t - 12t gross weight / 5t payload capacity</td>
</tr>
<tr>
<td>GLO</td>
<td>Truck</td>
<td>diesel driven, Euro 2, cargo</td>
<td>technology mix</td>
<td>7.5 t - 12t gross weight / 5t payload capacity</td>
</tr>
<tr>
<td>GLO</td>
<td>Truck</td>
<td>diesel driven, Euro 3, cargo</td>
<td>technology mix</td>
<td>7.5 t - 12t gross weight / 5t payload capacity</td>
</tr>
<tr>
<td>GLO</td>
<td>Truck</td>
<td>diesel driven, Euro 4, cargo</td>
<td>technology mix</td>
<td>7.5 t - 12t gross weight / 5t payload capacity</td>
</tr>
<tr>
<td>GLO</td>
<td>Truck</td>
<td>diesel driven, Euro 5, cargo</td>
<td>technology mix</td>
<td>7.5 t - 12t gross weight / 5t payload capacity</td>
</tr>
<tr>
<td>GLO</td>
<td>Truck</td>
<td>diesel driven, 1980s, cargo</td>
<td>technology mix</td>
<td>12-14t gross weight / 9,3t payload capacity</td>
</tr>
<tr>
<td>GLO</td>
<td>Truck</td>
<td>diesel driven, Euro 1, cargo</td>
<td>technology mix</td>
<td>12-14t gross weight / 9,3t payload capacity</td>
</tr>
<tr>
<td>GLO</td>
<td>Truck</td>
<td>diesel driven, Euro 2, cargo</td>
<td>technology mix</td>
<td>12-14t gross weight / 9,3t payload capacity</td>
</tr>
<tr>
<td>GLO</td>
<td>Truck</td>
<td>diesel driven, Euro 3, cargo</td>
<td>technology mix</td>
<td>12-14t gross weight / 9,3t payload capacity</td>
</tr>
<tr>
<td>GLO</td>
<td>Truck</td>
<td>diesel driven, Euro 4, cargo</td>
<td>technology mix</td>
<td>12-14t gross weight / 9,3t payload capacity</td>
</tr>
<tr>
<td>GLO</td>
<td>Truck</td>
<td>diesel driven, Euro 5, cargo</td>
<td>technology mix</td>
<td>12-14t gross weight / 9,3t payload capacity</td>
</tr>
<tr>
<td>GLO</td>
<td>Truck</td>
<td>diesel driven, 1980s, cargo</td>
<td>technology mix</td>
<td>14 - 20t gross weight / 11,4t payload capacity</td>
</tr>
<tr>
<td>GLO</td>
<td>Truck</td>
<td>diesel driven, Euro 1, cargo</td>
<td>technology mix</td>
<td>14 - 20t gross weight / 11,4t payload capacity</td>
</tr>
<tr>
<td>GLO</td>
<td>Truck</td>
<td>diesel driven, Euro 2, cargo</td>
<td>technology mix</td>
<td>14 - 20t gross weight / 11,4t payload capacity</td>
</tr>
<tr>
<td>GLO</td>
<td>Truck</td>
<td>diesel driven, Euro 3, cargo</td>
<td>technology mix</td>
<td>14 - 20t gross weight / 11,4t payload capacity</td>
</tr>
<tr>
<td>GLO</td>
<td>Truck</td>
<td>diesel driven, Euro 4, cargo</td>
<td>technology mix</td>
<td>14 - 20t gross weight / 11,4t payload capacity</td>
</tr>
<tr>
<td>GLO</td>
<td>Truck</td>
<td>diesel driven, Euro 5, cargo</td>
<td>technology mix</td>
<td>14 - 20t gross weight / 11,4t payload capacity</td>
</tr>
<tr>
<td>GLO</td>
<td>Truck</td>
<td>diesel driven, 1980s, cargo</td>
<td>technology mix</td>
<td>20 - 26t gross weight / 17,3t payload capacity</td>
</tr>
<tr>
<td>GLO</td>
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<td>diesel driven, Euro 1, cargo</td>
<td>technology mix</td>
<td>20 - 26t gross weight / 17,3t payload capacity</td>
</tr>
<tr>
<td>GLO</td>
<td>Truck</td>
<td>diesel driven, Euro 2, cargo</td>
<td>technology mix</td>
<td>20 - 26t gross weight / 17,3t payload capacity</td>
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<td>GLO</td>
<td>Truck</td>
<td>diesel driven, Euro 3, cargo</td>
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<tr>
<td>GLO</td>
<td>Truck</td>
<td>diesel driven, 1980s, cargo</td>
<td>technology mix</td>
<td>26 - 28t gross weight / 18,4t payload capacity</td>
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<tr>
<td>GLO</td>
<td>Truck</td>
<td>diesel driven, Euro 1, cargo</td>
<td>technology mix</td>
<td>26 - 28t gross weight / 18,4t payload capacity</td>
</tr>
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<td>GLO</td>
<td>Truck</td>
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<td>GLO</td>
<td>Truck</td>
<td>diesel driven, Euro 3, cargo</td>
<td>technology mix</td>
<td>26 - 28t gross weight / 18,4t payload capacity</td>
</tr>
</tbody>
</table>
GLO Truck diesel driven, Euro 4, cargo technology mix 26 - 28t gross weight / 18,4t payload capacity
GLO Truck diesel driven, Euro 5, cargo technology mix 26 - 28t gross weight / 18,4t payload capacity
GLO Truck diesel driven, 1980s, cargo technology mix 28 - 32t gross weight / 22t payload capacity
GLO Truck diesel driven, Euro 1, cargo technology mix 28 - 32t gross weight / 22t payload capacity
GLO Truck diesel driven, Euro 2, cargo technology mix 28 - 32t gross weight / 22t payload capacity
GLO Truck diesel driven, Euro 3, cargo technology mix 28 - 32t gross weight / 22t payload capacity
GLO Truck diesel driven, Euro 4, cargo technology mix 28 - 32t gross weight / 22t payload capacity
GLO Truck diesel driven, Euro 5, cargo technology mix 28 - 32t gross weight / 22t payload capacity
GLO Truck diesel driven, 1980s, cargo technology mix more than 32t gross weight / 24,7t payload capacity
GLO Truck diesel driven, Euro 1, cargo technology mix more than 32t gross weight / 24,7t payload capacity
GLO Truck diesel driven, Euro 2, cargo technology mix more than 32t gross weight / 24,7t payload capacity
GLO Truck diesel driven, Euro 3, cargo technology mix more than 32t gross weight / 24,7t payload capacity
GLO Truck diesel driven, Euro 4, cargo technology mix more than 32t gross weight / 24,7t payload capacity
GLO Truck diesel driven, Euro 5, cargo technology mix more than 32t gross weight / 24,7t payload capacity
GLO Truck-trailer diesel driven, 1980s, cargo technology mix up to 28t gross weight / 12,4t payload capacity
GLO Truck-trailer diesel driven, Euro 1, cargo technology mix up to 28t gross weight / 12,4t payload capacity
GLO Truck-trailer diesel driven, Euro 2, cargo technology mix up to 28t gross weight / 12,4t payload capacity
GLO Truck-trailer diesel driven, Euro 3, cargo technology mix up to 28t gross weight / 12,4t payload capacity
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GLO Truck-trailer diesel driven, Euro 5, cargo technology mix up to 28t gross weight / 12,4t payload capacity
GLO Truck-trailer diesel driven, 1980s, cargo technology mix 28 - 34t gross weight / 22t payload capacity
GLO Truck-trailer diesel driven, Euro 1, cargo technology mix 28 - 34t gross weight / 22t payload capacity
GLO Truck-trailer diesel driven, Euro 2, cargo technology mix 28 - 34t gross weight / 22t payload capacity
GLO Truck-trailer diesel driven, Euro 3, cargo technology mix 28 - 34t gross weight / 22t payload capacity
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GLO Truck-trailer diesel driven, Euro 5, cargo technology mix 28 - 34t gross weight / 22t payload capacity
GLO Truck-trailer diesel driven, 1980s, cargo technology mix 34 - 40 t gross weight / 27t payload capacity
GLO Truck-trailer diesel driven, Euro 1, cargo technology mix 34 - 40 t gross weight / 27t payload capacity
GLO Truck-trailer diesel driven, Euro 2, cargo technology mix 34 - 40 t gross weight / 27t payload capacity
GLO Truck-trailer diesel driven, Euro 3, cargo technology mix 34 - 40 t gross weight / 27t payload capacity
GLO Truck-trailer diesel driven, Euro 4, cargo technology mix 34 - 40 t gross weight / 27t payload capacity
GLO Truck-trailer diesel driven, Euro 5, cargo technology mix 34 - 40 t gross weight / 27t payload capacity
GLO Truck-trailer diesel driven, Euro 0 - 5 mix, cargo technology mix 34 - 40 t gross weight / 27t payload capacity

Aggregated Processes including Fuel

<table>
<thead>
<tr>
<th>Region</th>
<th>Name</th>
<th>Standard</th>
<th>Type</th>
<th>Gross Weight/Payload</th>
</tr>
</thead>
<tbody>
<tr>
<td>RER</td>
<td>Lorry transport</td>
<td>Euro 0, 1, 2, 3, 4 mix</td>
<td>production mix</td>
<td>22 t total weight, 17,3t max payload</td>
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<tr>
<td>RER</td>
<td>Articulated lorry transport</td>
<td>Euro 0, 1, 2, 3, 4 mix</td>
<td>production mix</td>
<td>40 t total weight, 27 t max payload</td>
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<tr>
<td>RER</td>
<td>Small lorry transport</td>
<td>Euro 0, 1, 2, 3, 4, 5 mix</td>
<td>production mix</td>
<td>7,5 t total weight, 3,3 t max payload</td>
</tr>
<tr>
<td>RER</td>
<td>Articulated lorry (40t) incl. fuel</td>
<td></td>
<td>technology mix</td>
<td></td>
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<tr>
<td>RER</td>
<td>Lorry (22t) incl. fuel</td>
<td>diesel driven, cargo</td>
<td>technology mix</td>
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</tr>
<tr>
<td>-----</td>
<td>------------------------</td>
<td>----------------------</td>
<td>----------------</td>
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</tr>
<tr>
<td>RER</td>
<td>Small lorry (7.5t) incl. fuel</td>
<td>diesel driven, cargo</td>
<td>technology mix 7.5t payload capacity</td>
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</tbody>
</table>