

Model for Climate Calculations of Transport



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Aim and Goal

- Calculate greenhouse gas emissions from freight transport
- Facilitate climate requirements for procuring authorities
- A basis for tender evaluation

Climateimpact

- The total climate emissions of transport in fossil kg CO₂e
- The life cycle perspective of the fuel is included:
 - Fuel consumption during transport “tank to wheel”
 - Production of the fuel “well to tank”
 - Vehicle production
 - Infrastructure construction
 - Waste management of the above

Method

- Based on information provided by suppliers in their bids, combined with embedded fuel data in the model
- The model should be able to subsequently show that differences in suppliers' climate emissions reflect the actual differences in emissions occurring during execution
- The tool and model are dynamic and should be regularly updated as fuel information changes

Tool

Suppliers input parameters

- Total fuel amounts broken down by given fuel types (m³, kg, kWh)
- Ability to add custom fuels
- Ability to specify the bio-share in vehicle gas

Vehicle activities are listed as separate entries, called *transport tasks*, which the supplier defines. Each transport task is assigned an identity (1, 2, 3...), and the supplier provides the following information for each transport task:

- Quantity of goods in the transport task (tons, cubic meters, pieces)
- Percentage of the transport distance attributed to the transport task (%) Total transport distance (km/year)
- (Number of delivery addresses)
- (Registration numbers of the vehicles used in the transport task)

** Since multiple different tasks may be mixed within the same transport*

Model

The model includes

- 11 different fuel types
- Energy content per fuel (MJ/quantity)
- Emission factors per fuel (kg fossil CO₂e/MJ), "well to wheel"

Together with the information provided by the supplier, the emission is calculated as: m³ fuel

* MJ/m³

* kg CO₂e/MJ

/ km

/ ton

= kg CO₂e / ton-km

Shortcomings in Method and Model

- Information regarding the routes provided before the transportation is not necessarily correct. Even if provided by the supplier.
- Difficult to verify the accuracy of the supplier's information, as plans may change and different fuels may be used in the same vehicle.
- The model needs to be tested in case studies to evaluate its usability.
- It is not straightforward how to express and compare climate emissions; alternative expressions: /ton-km; /m³-km; /piece-km; total or /km.
- Information about fuels, bio-content, emissions factors, etc., is complex and subject to change. The reduction obligation—i.e., the political requirement to reduce the climate footprint from fuel products such as gasoline and diesel—changes over time.

Two Versions of the Tool

