Calculating transport greenhouse gas emissions

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Background

- Finland’s annual transport greenhouse gas emissions have been previously calculated by VTT Technical Research Centre of Finland Ltd
- Statistics Finland will be responsible to calculate Finland’s annual transport greenhouse gas and exhaust emissions from statistical year 2023
Greenhouse gas emissions

GHG-emissions are reported to European Union and to United Nations

- In Energy sector
  - Energy used by transport
    - All transport modes
    - Transport statistics by mode is source information
      - Number and type of vehicles, transport performance, emission coefficients
Transport modes

**Railway transport**
- Closed transport system
- Data available on train movements
- From Finnish Transport Infrastructure Agency

**Maritime transport**
- Transport between ports of Finland and foreign countries

**Air transport**
- Data available on flights through Finnish Airports

**Road transport**
- Number of vehicles
- Traffic performance?
- Electrification?
Maritime transport

Maritime transport

→ data available on maritime transport between Finland and foreign countries
  • Information on port visits from Finnish Transport and Communications Agency Traficom
  • Engine types for Finnish ships obtained from Finnish register of ships
  • Information on engine types for foreign ships?
  ➢ Other data sources needed (AIS data,...)
Calculating greenhouse gas emissions

Transport statistics needed:
- By transport mode
- By applicable strata (driving power, age of vehicle, emission class standards,...)

1. Number of vehicles
2. Traffic/transport performance (kilometres, tonne-km,..)
3. Emission coefficients (g/km)

\[ \text{Emissions} = \text{number of vehicles} \times \text{traffic performance} \times \text{emission coefficients} \]

- Greenhouse gases (CO$_2$, CH$_4$, O$_3$,..)
- Exhaust emissions (NOx, CO, HC,..)
Road traffic performance

**Total car-kilometres**
- Based data on regular vehicle inspections
- Odometer readings of cars are included in motor vehicle stock data
- Kilometrage pairs, missing data
- Vehicle-kilometres by car class are estimated by Statistics Finland

**Kilometrage on highways**
- Based on the Finnish Transport Infrastructure Agency’s highway traffic automatic calculations
- A distinction by light cars, heavy cars and road trains

**Kilometrages on private roads and streets**
- Is calculated as a difference between the total kilometrage and the total kilometrage on public highways
- Total = highways (75%) + private roads and streets (25%)
Kilometrage on streets and private roads = Total kilometrage - Highways

<table>
<thead>
<tr>
<th></th>
<th>Highways</th>
<th>Streets and private roads</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mill. vehicle-km</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Passenger cars</td>
<td>28 986</td>
<td>9 785</td>
<td>38 771</td>
</tr>
<tr>
<td>Vans</td>
<td>4 335</td>
<td>1 442</td>
<td>5 777</td>
</tr>
<tr>
<td>Trucks</td>
<td>2 958</td>
<td>338</td>
<td>3 296</td>
</tr>
<tr>
<td>Buses and coaches</td>
<td>315</td>
<td>146</td>
<td>461</td>
</tr>
<tr>
<td>Cars total</td>
<td>36 594</td>
<td>11 711</td>
<td>48 305</td>
</tr>
</tbody>
</table>
Data gaps and challenges for vehicle kilometres

Total vehicle kilometres driven during year is based on regular vehicle inspections
- Legislation on passenger car and van inspections changed in 2018: first inspection after four years since first registration, after that biennial inspection at 6 to 10 years
  ➢ Less information on the newer passenger cars and vans
    • which are driven relatively lot
  ➢ Less information on electric cars
    ➢ Less information on consumption of electricity in road transport

  ➢ Less information on yearly changes
    • Unexpected effects like Covid-19 pandemic

  ➢ Less information on total kilometrage
    ➢ Less information on kilometrage on streets and private roads
Road vehicle kilometrage

- Road vehicle kilometrage is key figure indicator
- Source information for emission calculations
- Source information also for other indicators like passenger kilometres
  - Average number of passengers during passenger car trip
    - Finland’s National Travel Survey 2021 (by Traficom)

- Demand for new data sources for national total vehicle kilometrage
  - or kilometrage on streets and private roads
  - By vehicle class and type of driving power
Conclusions

✓ Statistics Finland will calculate Finland’s annual transport greenhouse gas emissions from statistical year 2023
✓ In cooperation with several statistics
✓ Covering all transport modes and also working machines

✓ Transport statistics by mode is source information
✓ Data availability depends on transport mode
✓ There are data gaps and challenges in road transport sector
Thank you