Experiences with GHG Baselines and Monitoring in the Transport Sector

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12 December 2018

COP24 side event: GHG baselines, monitoring methodologies and tools to support MRV at national level
Transport Volume of the Compendium

1. Intra-urban mass rapid transit investments
2. Comprehensive urban transport programmes
3. Vehicle efficiency improvement programmes
4. Alternative fuels incentives
5. Inter-urban rail infrastructure
6. Freight transport infrastructure investments to shift mode
7. National fuel economy standards
8. Fuel pricing policies
Mitigation actions are grouped by main effect …

E.g. mass rapid transit investments

Alternative fuels incentives
For each action a causal chain is used to illustrate the main effects at a glance.

Shows the variables that are targeted by the mitigation action components and how they should be affected.
# System boundaries

## Mapping life cycle GHG emissions in the transport sector

<table>
<thead>
<tr>
<th>Upstream</th>
<th>Activity/Operation</th>
<th>Downstream</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vehicle</strong>&lt;br&gt; Emissions from vehicle production&lt;br&gt; e.g. materials, energy use</td>
<td><strong>Activity/Structure (AS)</strong>&lt;br&gt; travel distance (VKT)&lt;br&gt; fleet composition&lt;br&gt; mode split&lt;br&gt; <strong>Intensity (I)</strong>&lt;br&gt; energy efficiency&lt;br&gt; load, speed and traffic conditions</td>
<td><strong>Emissions from vehicle scrapping and disposal</strong>&lt;br&gt; e.g. energy use, leaked refrigerants</td>
</tr>
<tr>
<td><strong>Fuel</strong>&lt;br&gt; Emissions from fuel production&lt;br&gt; e.g. refineries, power plants</td>
<td><strong>Emissions from fuel combustion (F)</strong>&lt;br&gt; by fuel type (and carbon content)</td>
<td></td>
</tr>
<tr>
<td><strong>Infrastructure</strong>&lt;br&gt; Emissions from infrastructure construction&lt;br&gt; e.g. materials, energy use</td>
<td><strong>Emissions from infrastructure usage</strong>&lt;br&gt; e.g. maintenance and operation of stations/terminals</td>
<td><strong>Emissions from infrastructure dismantling</strong>&lt;br&gt; e.g. energy use</td>
</tr>
</tbody>
</table>

- **Main impact (usually to be monitored)**
- **Additional impact (usually defaults or only rough assessment)**
In addition to the maps, the Volume also has a tabular guide and descriptions.

Guidance is provided on the selection of analysis tools.

- Level of accuracy of the tool
- Objective of analysis
- Nature of tool

Navigation maps help users judge:

- Ex-ante
  - Mitigation planning
    - Objective: Prioritize policies
    - Lower accuracy tools: Spreadsheet tools with defaults, CCAP Emissions Guidebook
  - Mitigation planning
    - Objective: Report results
    - Lower accuracy tools: Spreadsheet tools with local data
    - Medium accuracy tools: EERPAT, MOVES
    - Higher accuracy tools: AFLEET
  - Mitigation planning
    - Objective: Emissions trading
    - Higher accuracy tools: CDM methodologies
      - AMS-III.1.
      - AMS-III.AK.
      - AMS-III.AQ.
      - AMS-III.AY.
      - AMS-III.S.
      - ACM0027
Tabular guides on the selection of analysis tools provide more detail...

Disaggregate emissions models for alternative fuels mitigation actions
Ease of use/data collection: Highly resource and data intensive

<table>
<thead>
<tr>
<th>Name</th>
<th>Application / summary</th>
<th>Scope</th>
<th>Developer</th>
<th>Methodology documentation</th>
<th>Data collection guidance</th>
<th>Defaults provided</th>
<th>Cost of tool</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOVES</td>
<td>Emissions model</td>
<td>Requires VKT and speed inputs</td>
<td>US EPA</td>
<td>Very good</td>
<td>Fair</td>
<td>Defaults for USA -- allows user input for other areas</td>
<td>Free</td>
</tr>
<tr>
<td>EERPAT</td>
<td>Non-spatial disaggregate model</td>
<td>Includes emissions module</td>
<td>US Federal Highway Administration</td>
<td>Very good</td>
<td>Good</td>
<td>Defaults for USA -- allows user input for other areas</td>
<td>Free</td>
</tr>
<tr>
<td>AFLEET</td>
<td>Emissions and costs model for fleets.</td>
<td>Fleet data and fuel costs</td>
<td>Argonne National Laboratory</td>
<td>Good</td>
<td>Good</td>
<td>Defaults for USA including WTW upstream emissions</td>
<td>Free</td>
</tr>
</tbody>
</table>

Source: Disaggregate emissions models: Table 29 of the Compendium
Joint webinar series on the Transport Volume

- 6 webinars held so far
- All recordings can be found at:

GIZ’s Guidance on MRV in Transport

2015: Navigating Transport NAMAs: Handbook (Chapter 2: MRV)
- Offers practical advice on NAMA selection, MRV, finance and registration. It builds upon a high number of examples

2016: Reference Document on MRV in Transport (new updated 2018 version)
- Guidance on how to develop comprehensive and consistent national systems for MRV of transport related emissions

2017: Bottom-Up GHG Inventory and MRV of Measures
- Explains synergies and limitations of using transport sector bottom-up GHG inventories for the MRV of measures

2017: Compendium on GHG Baselines and Monitoring
- Guidance on available methodologies for MRV of transport mitigation actions

2018: A Beginners Guide to Emissions Accounting in Transport
- Introduces key principles for quantifying GHG emissions in transport and literature
GIZ tools for quantifying emissions

**TrIGGER: Transport Inventory and Greenhouse Gas Emissions Reporting Tool**

→ A simple bottom-up spreadsheet model to calculate national transport GHG inventories. Developed with the Institute for Environment and Energy (IFEU).


**FESET: Fuel Economy Standards Evaluation Tool**

→ A spreadsheet tool to calculate emission reductions from the introduction of new light duty vehicle fuel economy or CO₂ standards. Developed by the International Council for Clean Transportation (ICCT).

Example applications – Inventory Tool TRiGGER in Vietnam

Total road transport emission: 29,8 Mt CO₂ (=90% of total transport emissions in Vietnam in 2015).

1/3 of road transport emissions in Vietnam result from motorcycles!

Photo credits: Daniel Bongardt
Other relevant Sectors:
Buildings and Construction Sector

Programme for Energy Efficiency in Buildings - PEEB

German and French Programme to support countries to reduce GHG in the buildings and construction sector

36% of the global final energy consumption

≈ 40% of CO₂ emissions
Thank you!

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