UNITED NATIONS

ForFITS
A monitoring and assessment tool "For Future Inland Transport Systems"

Evaluating CO_2 emissions in inland transport and climate change mitigation

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ForFITS Model requirements

Key model requirements

- Freely available software to be developed between 2011 and 2013
- Allow the estimation/assessment of emissions in transport
- Allow the evaluation of transport policies for CO_2 emission mitigation

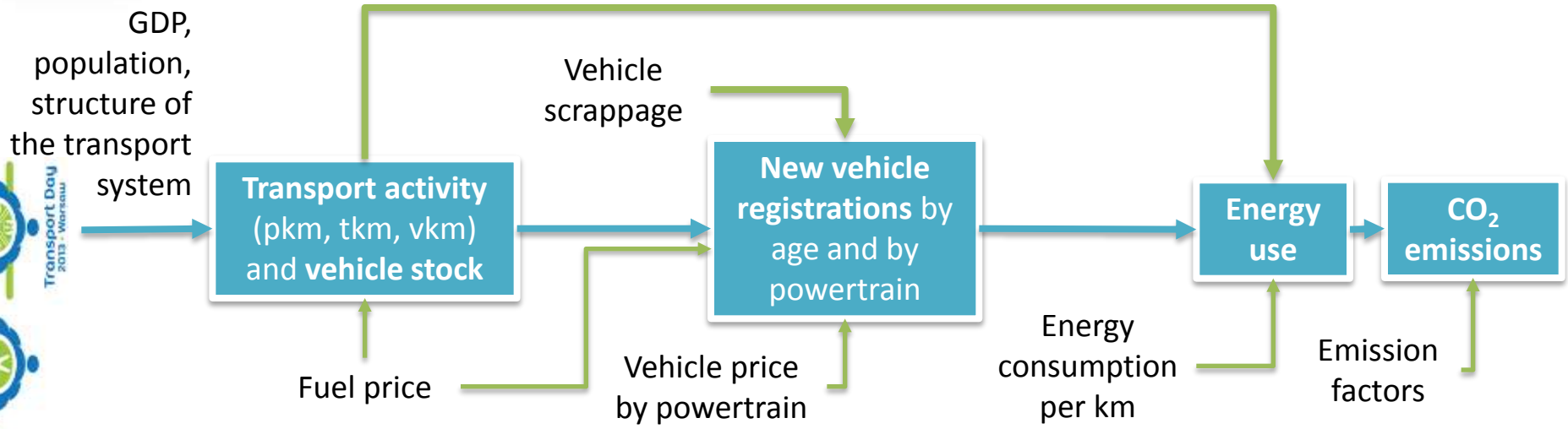
This was achieved creating a model that converts information on transport activity into fuel consumption and CO_2 emissions considering the influence of the socio-economic parameters and policy levers

- Sectoral transport model, not including feedback on economic growth
- Local, national, international applications are possible
- The model is flexible with respect to data needs

ForFITS model Coverage

- Passenger and freight transport services
- Two different areas (e.g. to define the transport systems: urban, non-urban, non-spec.)
- Nine transport modes: non-motorized transport, two wheelers, three wheelers, light road vehicles (cars/light commercial vehicles), medium and heavy road vehicles (buses/trucks), rail, navigation (passenger: boats and ferries; freight: inland, short-sea and deep-sea/maritime), air and pipelines
- Different vehicle subsets within each mode (organized in six vehicle classes – A to F) (figures)
- 31 powertrain technologies (e.g. internal combustion engines, hydraulic hybrids, electric hybrids, plug-ins, fuel cell, electric)
- 10 fuel blends, some of which are associated with specific modes and/or powertrains

ForFITS model Key modelling steps



- Four key modelling steps
- Generation of transport activity (pkm, tkm, vkm) and vehicle stock
- Evaluation of new vehicle registrations by powertrain and characterization of the vehicles by age
- Calculation of the energy use
- Estimation of CO_2 emissions

ForFITS model Demand generation

Transport activity (pkm, tkm), vehicle activity (vkm) and vehicle stock are largely determined by:

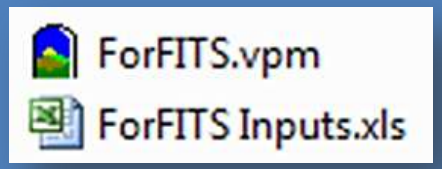
- **Relationships linking GDP and population with transport activity**
  - ✓ GDP per capita with vehicle ownership and pkm
  - ✓ Economic output (GDP) with tonnes lifted
- **Effects of changes in the cost of driving and moving goods**
  - ✓ Elasticities of pkm, tkm, average travel and average loads
- **Structural changes in the transport system**
  - ✓ Passenger transport system: this is mainly related to the role of public transport, to assess policies related with modal shift
  - ✓ Freight transport system: this is mainly related with changes of the economic structure and sourcing patters, via their impacts on modal choice and the average length of hauls

ForFITS model File structure

ForFITS was developed in the Vensim modelling environment

Two components

- Vensim Packaged Model (VPM file)
- Excel input interface (XLS file)



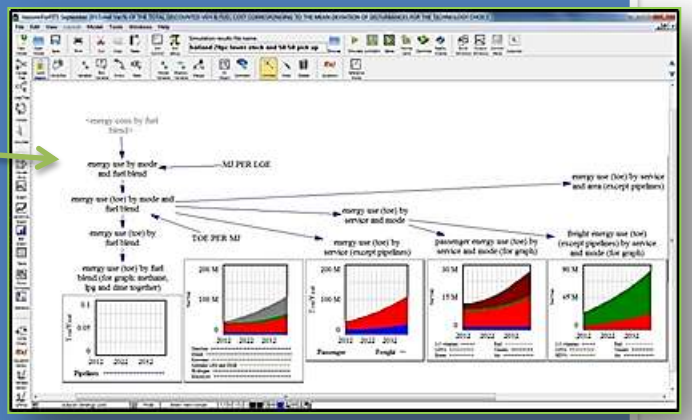
Both the files are freely available and can be downloaded on line on the UNECE web site: http://www.unece.org/trans/theme_forfits.html

The ForFITS user manual is also accessible on the UNECE web site: http://www.unece.org/trans/forfits_user_manual.html

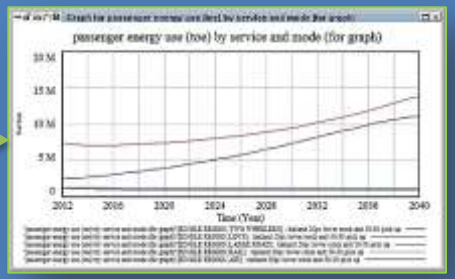
ForFITS model Results

Results can be visualized in several ways:

- In the “output” views of the VPM file



- With a graphical interface in the VPM file



- As a table in the VPM file

- Extracting tables in .txt files (readable and editable in Excel)

ForFITS model Evaluating mitigation impacts and/or potentials

How to evaluate policy impacts, CO2 emission mitigation potentials and the change in emission levels due to changes in the driving elements influencing the transport system?

- **Need to develop at least two scenarios:**
  - ✓ Reference case, e.g. reflecting baseline assumptions on fuel prices, no changes in tax structure, no changes in the structural characteristics
  - ✓ One (or more) alternatives, taking into account for changes in assumptions and the implementation of new policies, such as:
    - taxation (e.g. on vehicles and/or fuels)
    - structural modifications, e.g. reflecting a shift towards or away from public transport
- **Need to compare results: emissions, energy consumption, transport activity, vehicles, and costs**

Links and contact information

Links

Model download/UNDA project page

http://www.unece.org/trans/theme_forfits.html

User manual, including methodological information

http://www.unece.org/trans/forfits_user_manual.html

Contact information

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Thank you for the attention