

## ASSESSMENT AND FURTHER DEVELOPMENT OF THE TREMOVE MODEL

### Minutes of the kick-off meeting

Brussels 17.10.2001

#### **Attendance:**

Matti Vainio	DG ENV.C.1
Klaus Keisel	DG ENV.C.1
Peter Wicks	DG ENV.C.1
Jacques Delsalle	DG ECFIN.-E.4
Catharina Sikow-Magny	DG TREN.B.1
Tom Howes	DG TREN.B.1
Frank Jost	DG TREN.E. 3
Katri Kosonen	DG TAXUD.C.5
Christine Sauer	DG TAXUD.C.4
Marco Ponti	TRT
Angelo Martino	TRT

#### *Apologies*

Peter Zapfel	DG ENV.E.1
Franz Söldner	DG TREN.A.1
Manfred Decker	DG TREN.B.1
Anna Panagopoulou	DG TREN.B.1
Domenico Rossetti di Valdalbero	DG RTD.J.1
Giorgios Liolios	DG TAXUD.C.4
Graham Lock	Eurostat.F.3
Andre Jol	EEA

#### **Agenda**

1. Purpose (ENV)
2. Work plan (TRT)
3. Main related activities: (ARTEMIS, ETIS, SCENES, TERM, TRENDS, etc.)
4. Contact group meeting
5. Agree on working methods
6. AOB

## 1. Purpose

Matti Vainio opened the meeting and welcomed the participants to the ad hoc Steering Group. He briefly resumed the history of the project and the purpose of the meeting. He reiterated the purpose of the assessment, i.e. *to have a well-specified development plan for the TREMOVE model, including the required specifications for an updated version of TREMOVE. This development plan needs to also specify what the role of the TREMOVE model would be among other similar models in the EU*". (extract of the terms of reference)

The decision to have an assessment of the TREMOVE model dates back to the beginning of the year 2001, when DG ENV had to decide whether and in which direction to further invest of the development of the model. The assessment project was then launched by DG ENV, with the help of DG ECFIN, DG TAXUD and DG TREN.

The TREMOVE model was originally developed to support the policy assessment process within the framework of the Auto-Oil II Programme, and it is seen now as the best candidate to act as quantitative support for the transport related emissions in the Clean Air for Europe (CAFE) programme launched by the European Commission. Further, the Commission needs to have a transport model that looks into the greenhouse gas (GHG) emissions from transport sector.

The scope of the project is then to assess the technical capability of TREMOVE for such a role and its positioning in the context of the other models and projects dealing with energy, transport and emissions at European level.

## 2. Work plan

Angelo Martino (TRT) presented the plan of activities for the assessment and further development of the TREMOVE model. The discussion focused on four main issues:

- (i) the definition of the expected use of TREMOVE in the future;
- (ii) the current and the desirable features of TREMOVE;
- (iii) the possible link between TREMOVE and transport models; and
- (iv) the position of TREMOVE with respects to other existing projects and models generally dealing with transport and the environment.

### Policies and impacts of interest

The first theme – the future use of the model – became the focus of the discussion with respect to two different aspects:

- a) the types of policies that might be tested using TREMOVE and
- b) the types of policy impacts that the Commission services are interested in.

All the participants gave suggestions, which are summarised below (with some overlapping).

*Policies:*

- analysis of the impact of tax policies, including taxes on vehicle possession and on fuel and energy use (allowing for distinction among countries),
- analysis of pricing policies for all modes of transport (i.e. considering rail, air and maritime transport together with road) and in particular urban road pricing,
- assessment of the impacts of transport infrastructure projects, in particular the Trans-European networks.
- analysis of regulatory measures (along the lines of the White Paper on the CTP recently issued by the Commission) affecting users (eco-driving techniques), vehicles (introduction of automatic speed limits for trucks and vehicle maintenance schemes) and freight intermodality,
- analysis of technology policies, paying particular attention to the incentives and measures that might be launched to favour the technical development of the vehicles market, i.e. in what way fuel cell vehicles could be introduced:
  - (i) provision/subsidising of infrastructure (filling stations, etc.)
  - (ii) subsidizing hydrogen (e.g. tax exemptions) and
  - (iii) support to vehicle technologies; which is the potential to use cleaner (even fuel cell or electric) two wheel vehicles and their environmental impact,
- analysis of measures affecting short distance mobility (including slow modes of transport),
- analysis of policies to favour public transport in urban areas,
- analysis of non technical measures in general,
- analysis of land use policies.

*Impacts:*

- analysis of impacts on transport behaviour,

- analysis of impacts on the environment, with focus on noise, pollutant emissions and life cycle assessment,
- analysis of consequences of transport policies at macroeconomic level,
- analysis of impacts on network congestion and on modal share,
- analysis of distributional impact, across geographical areas and income groups, and of transport policies vs. infrastructure investments.

The discussion concentrated on how to deal with such a broad range of impacts, which is definitely wider than in the original TREMOVE model. In addition, the possibility to establish a *two levels system* for TREMOVE was discussed: i) introducing a distinction between those impacts that can be simulated by the core model and ii) those that can be taken into account by means of bi-directional links with other existing models.

Jacques Delsalle of ECFIN proposed that a rough sketch of the enhanced TREMOVE model be drawn as soon as possible. This sketch should have clear boundaries and some minimum requirements and essentially cover task 1.1 a). He suggested that this sketch be sent to the ad hoc Steering Group a few weeks after the Contact Group meeting in order to give instant feedback. In this way the consultant would get a steer for the writing the draft final report. He concluded that it is absolutely vital to get a clear understanding of the niche on which the enhanced TREMOVE model has to be build on.

Additionally, he reminded of the importance of defining a common set of inputs for all the strategic transport/energy/environment models used at the European level, ensuring that the results can be use in a useful way instead of being comparing baselines, data sources and key assumptions. Thus, TREMOVE would be part of a set of models which shares a common baseline and offer different specialisations. This point is also picked up by Matti Vainio - for its interest in the project development - and by Catharina Sikow – in relation with the ETIS (European Transport Information System) projects managed by DG TREN.

### Desirable features of TREMOVE

TRT presented a preliminary tentative list of desirable features of TREMOVE (Annex 1), which was analysed and discussed. The list had been drafted keeping the TREMOVE model purpose as it was originally designed and therefore it has some missing points in relation to the needs highlighted in the discussion reported above. The main points were:

- extending the coverage of transport modes, adding sea shipping, air transport and inland navigation;

- extending the coverage of pollutants, adding new ones (HFCs, CH<sub>4</sub>, N<sub>2</sub>O, Ozone concentration and any other element which is reputed as relevant);
- extending the geographical scope, including non-EU countries like Norway and Switzerland and accession countries ;
- improving the representation of trip categories (e.g. passenger trip purposes, freight commodity types) and of transport behaviour (modal choice, network congestion, etc.);
- improving the classification of vehicles in order to match the needs of new emerging technologies;
- improving the representation of long-distance road traffic;
- improving the user-friendliness of the model interface of the TREMOVE model.

It was made clear that concerning the improvement of the user-friendliness of the model interface the point of view of the Commission services, the user friendliness is a priority in terms of readability of model results and possibility to easily set up simulation scenarios. It was emphasised that, i.a. due to the continuous rotation of the Commission staff between jobs, it is very unlikely that the Commission would developed expertise to run (at least complicated scenarios) the TREMOVE model. Rather TREMOVE (or any other models) are likely to be run by expert(s) outside the Commission under a framework contract to maintain the model and to run policy scenarios with a short reaction time.

### **3. Main related activities**

A review of the EU projects and programmes is carried out on the basis of the presentations of the ad hoc Steering Group. The list includes:

- *ARTEMIS (DG TREN)*. A project of four - years with 35 partners led by TRL dealing with emissions from all modes of transport – two wheelers, cars, light duty vehicles, heavy duty vehicles, rail, air and maritime. The project considers also the life cycle assessment and takes into account also the non-regulated pollutants and the influences of auxiliary equipment (air conditioners). ARTEMIS is developed in close co-operation with Member States and the EEA. The European Transport Emissions Review Group (ETERG) has been formed as part of this project. ETERG includes representatives of the EU and Member States, and provides a convenient avenue for the transmission of data and information to and from the project and the national representatives.
- *PARTICULATES (DG TREN)*. The three-year research project is aimed at a further characterisation of exhaust particulate emissions from road vehicles.

ARTEMIS and PARTICULATES have been set up in order to achieve harmonisation of transport emissions and emission models in Europe.

- *REVEAL (DG TREN)*. A research project aimed at developing an infrared device to analyse in real time the concentration of pollutants in the vehicle plume.
- *ETIS research projects (DG TREN)*. This is an area of research managed by DG TREN with the aim to offer decision-makers with a modelling service in support of transport policy making. One of the actions undertaken concerns a common baseline for transport models and databases. The active projects are DATALINE (a pan-European long distance passenger mobility survey) and SPOTLIGHTS (a thematic network for European transport modellers to explore ways for advanced transport models fully transparent to end-users, open and more into policy-making processes). A third project about the definition of the ETIS interface is going to be launched.
- *SCENES (DG TREN)*. The research project has been completed producing a strategic transport forecasting model of EU 15. The model is quite detailed as it deals with all modes of transport and all trips, including short distance mobility on slow modes. The model is being now linked with E3ME an econometric model of Europe in the TIPMAC project to assess the impact of transport policies and investments in the macroeconomic sector (in parallel with SCENES-E3ME, the system dynamics ASTRA model of Europe will also be used and the two results will be compared). SCENES is also used in EXPEDITE (interaction between different demand segments in Europe), SUMMA (development of indicators for social and environmental sustainability for transport policies), SPECTRUM (use of models to look at the impact of policies on the welfare).
- *UNITE (DG TREN)*. The research project is developing a pilot transport accounts of social costs and revenues of transport in Europe with forecasts to the year 2005. In parallel, 30 case studies on marginal cost of transport will be analysed and eventually a integration of the two approaches will be produced. *TRENDS (Transport and Environmental Database System) (DG TREN)*. The programme is managed by Eurostat and DG TREN and it is a centralised application of harmonised (MEET) methodologies with time series, high temporal and spatial resolution, attribution to transport activities (first time a link with statistics). “Central” estimates should be consistent with national data regarding: vehicle fleets and distributions, vehicle mileage, statistical fuel consumptions and reported emission estimates for the past, with the objective to enhance the understanding of future trends as reported by the countries. A useful example of linking of models and programmes is given by the structure on how TRENDS is connected to other models:
  - a) PRIMES provides the overall energy consumption boundary conditions,

- b) TRENDS is calibrated against these estimates (i.e. translates the energy/fuel into vehicle fleets, mileage and distributions) and emissions are calculated distributed to different technologies/classes,
- c) Average – weighted- emission factors are produced to be further used as input to e.g. RAINS, or for more global calculations (focus on urban emissions possible)
- *CAFE (DG ENV)* (<http://europa.eu.int/comm/environment/air/cafe.htm>). This is programme launched last May by DG ENV on air quality by the year 2004. In some way it follows the lines of the Auto Oil programmes but with a wider scope and includes air quality (standards for concentrations), national emissions guidelines, sector specifications. The programme will also introduce the integrated assessment of the initiatives under study.
- *PRIMES (DG ENV)* . The development of the PRIMES energy system model has been supported by a series of research programmes of the European Commission. PRIMES is a modelling system that simulates a market equilibrium solution for energy supply and demand in the EU member states. It is conceived for forecasting, scenario construction and policy impact analysis, covering a medium to long-term horizon. Demand is evaluated at a national level in different sectors: residential, commercial, industry, transport.
- *RAINS (IIASA)* (<http://www.iiasa.ac.at/~rains/home.html>). It is a tool for analysing alternative strategies to reduce acidification, eutrophication and ground-level ozone in Europe. The model combines a variety of information relevant for the development of cost-effective emission control strategies in Europe: projections of future economic, agricultural and energy development in 38 European countries, the present and future emissions of SO<sub>2</sub>, NO<sub>x</sub>, VOC and NH<sub>3</sub> resulting from these activities, the options for reducing emissions and the costs of these measures, the atmospheric dispersion characteristics of sulphur and nitrogen compounds and the formation of ground-level ozone, and the environmental sensitivities of ecosystems towards acidification, eutrophication and ground-level ozone.
- *COWI Model (DG ENV)*. It estimates the effect of fiscal measures on CO<sub>2</sub> emissions from new passenger cars. This is done by calculating the demand for passenger cars in each of the 15 EU Member States. A detailed car choice framework is the core of the model with elasticities of demand with respect to several attributes. The elasticities were calibrated on a full-scale database of new cars registration on Denmark.

Summarising the discussions and the relations among the different models, it appeared quite clear that there are many relevant projects which might be linked (in both ways) the enhanced TREMOVE model: the general recommendation to the consultant was to try to exploit as much as possible such synergies, avoiding to replicate modelling work already carried out.

DG ENV emphasised that their preliminary orientation is to see TREMOVE as one of the reference models for the CAFE programme together with RAINS (climate), PRIMES (energy) and, if the link can be made to work, with SCENES (transport) and an agricultural model. Further, TREMOVE model would also be used in the work concerning greenhouse gas emissions.

#### **4. Contact group meeting**

It was agreed to have a contact group meeting in mid-November. The contact group is aimed at collecting the input of various stakeholders which is crucial for a successful completion of this assignment. The meeting was seen as an initiation of a network of expertise to which the consultant can tap after the meeting to get views and suggestions.

#### **5. Agreement on working methods**

It was agreed that the consultants and the members of the *ad hoc* Steering Group should be mainly in direct contact with one another. Matti Vainio should be copied the correspondence (to keep the file complete). Unless otherwise agreed, project related documents (minutes, agendas etc.) will be sent through Matti Vainio (who will also collect the comments from the Steering Group members). DG Environment will place the reports and minutes of the meetings placed on the web by to allow for an efficient dissemination of information.

#### **6. Next *ad hoc* Steering Group meeting**

Next *ad hoc* Steering Group meeting will be held when the draft final report is ready, i.e. in late January 2002.