

Potential New Phase for the IEA Transport Sector Analysis

Deliberative Discussion DRAFT

Introduction. The International Energy Agency (IEA) and its network are interested in completing and publishing a major transportation sector analysis in 2007. The IEA Mobility Model (MoMo) model, including improvements and analysis conducted to date, could form a key part of the basis for the analysis and report. The IEA's Energy Technology Perspectives (ETP) optimisation model analysis could contribute the transport sector report. The proposed analysis may have important implications and benefits for MoMo partners. This deliberative DRAFT prospectus outlines possible future tasks.

Background. The recently completed MoMo development project provided a useful analysis of options for reducing GHG emissions and employing alternative fuels and technologies in the transport sector. The initial effort focused primarily on light-duty vehicles. The results are primarily in the form of vehicle technology/fuel comparisons, with little linkage to specific policies to achieve particular results (for example, hybrids running on Brazilian ethanol could provide substantial, very low cost CO₂ reductions – but the MoMo project provides no clear pathway for reach a large utilisation of this vehicle type and fuel type).

The ETP model is specifically designed to assess technological solutions for energy problems. The model simulates world energy supply and demand with a time horizon of 2050, based on a detailed technology approach. Technology options are selected that meet energy policy targets and consumer demand at minimum cost. To date, the model has been used for analysis of prospects of CO₂ capture and storage and a study on the prospects for hydrogen and fuel cells. At the moment the ETP model is being used for the Global Energy Technology Perspectives (GTP) study, which assesses technology strategies for stabilization of global CO₂ emissions. The plan is to publish the initial GTP in March 2006, with a second version to be published in 2007.

While the IEA and its partners have invested in ETP and MOMO development and initial testing we do not believe we have fully utilized the potential of the state-of-the-art analytical tools. Thus, we seek advice and guidance from our partners regarding the scope and direction of future analytical activities.

Future Directions. The IEA is now in a period of reflection regarding the future of its transport sector activities. Preliminary feedback from IEA stakeholders suggests this effort is important and should be continued and possibly intensified. Thus, we are now considering future investments and directions of this activity. Future questions and analytical approaches that the IEA could address in a major transport sector analysis and report include:

- In-depth analysis of transport technology/fuel options beyond the LDV sector (i.e. covering trucking, shipping, rail and air travel).
- Analysis of selected strategies beyond the direct vehicle/fuel-related measures covered in MoMo. Investment in transit systems, land use planning and other mobility strategies with a focus on developing countries could be an option.
- Analysis of how transport options compare in terms of potential magnitude of reductions, their costs and benefits to GHG reduction options in other sectors, such as electric power.
- Analysis of best practices and policies aimed to achieve the more promising transport options. This would include identification of policy alternatives and some modelling of their likely

impacts, the needed intensity of the policies to reach given targets, and their “efficiency” in terms of costs and other parameters (apart from the basic technology/fuel costs).

- Assessment of net energy and economic impacts of large scale shifts in transport patterns, coupled with shifts in other sectors as part of a large scale climate initiative - e.g. net demand for hydrogen across sectors and its likely impacts on hydrogen supply sources and costs; the net impacts on the demand for fossil fuels like oil and natural gas, and on the sourcing and price impacts for these fuels.
- In-depth analysis or case studies of the emerging transport sectors of key developing countries, such as China/India/Indonesia/Brazil and build on recent assignments received from G8 countries
- To conduct these analysis some upgrades would be needed to the MoMo model, which would then be reflected in the IEA’s ETP optimization model.

Required MoMo model upgrades. There are a number of possible upgrades and revisions that could be made to the MoMo model as part of a new project phase. These would include:

- Introduction of a stock model for non-LDV modes (at least road transport, eventually air, depending on data availability)
- Evaluation of costs for non-LDV vehicles and fuels
- Creation of user control sheet interfaces for non-LDV modes (and a general revamping of the spreadsheet to ensure that it stays within certain size/memory constraints)
- Introduction of simple economic (price/supply/demand) relationships within the MoMo model, through the use of elasticity’s. This will allow analysis of pricing policies, such as differential fuel or vehicle taxation strategies
- Refinement of the SUV and car separation, including improved data for SUV and cars sales/stock shares for the developing world
- Introduction of a more detailed historical series for the stock model, using indicators (1970 to 2000)
- Introduction of several new distinct regions. These could include Japan, China, India, Mexico, Indonesia and/or Brazil (some progress has been made toward this already in the ETP model). This could be done in combination with case studies and intensive data collection efforts within each country
- Extension of the materials module to non-LDV modes (at least road modes)
- Modules for the evaluation of resource availability potentials for biofuels and conventional crude oil (this section may benefit from the work already done for the ETP model)

The transport module in the ETP model. The ETP model uses the MoMo spreadsheet data in its transport module is the best tool to compare transport policies to policies in other sectors, and to provide some of the economic feedback analysis. ETP work that could be of interest in the field of transport includes:

- Assessment of the competition of biofuels and hydrogen in the transportation sector.
- Analysis of the competition of biomass use for transportation fuels, heating or electricity production.
- Analysis of oil peaking and its impact on alternative fuel markets. A lot of work has been done in 2005 to develop a detailed oil & gas supply module, but more work is needed to draw robust conclusions.
- Analysis of the impact of CO₂ policies on the transportation sector.
- Oil price projections and their impact on alternative fuels complementing WEO.
- Interaction of supply security and CO₂ reduction policies.
- Analysis of the potential of plug-in hybrids and direct ethanol/methanol fuel cell vehicles vs. hydrogen fuel cell vehicles.
- The MoMo and the ETP models can benefit from other on-going IEA activities, such as data updates (spring 2006) and enlargement (2006) to include some big non-IEA members (probably China, India, Mexico, South Africa and Brazil). This includes the IEA indicators database, which contains detailed information on transport modes, as part of the work done here under the mandate given to the Agency earlier this year by the G8.

Gleneagles G8 Plan of Action: Dialogue on Climate Change, Clean Energy and Sustainable Development. At their Gleneagles Summit in July 2005, G8 Leaders addressed the challenges of climate change and securing clean energy and sustainable development. The G8 leaders asked the IEA to be a partner and play a major role in delivering the Plan of Action. This effort involves six broad areas of analysis: alternative energy scenarios and strategies, energy efficiency in buildings, appliances, transport and industry, cleaner fossil fuels, carbon capture and storage, renewable energy and enhanced international cooperation. The IEA will work closely with its traditional network, Brazil, China, India, Mexico and South Africa in this activity. The World Bank and other intergovernmental bodies are also close collaborators. Cooperation with the IEA G8 activity could help leverage resources and be beneficial to MOMO stakeholders.

An Opportunity to work with UNEP. Within the United Nations Environment Program (UNEP) the Global Environment Facility (GEF) division develops projects including activities focused on developing sustainable transport systems around the world. Recently approved projects include initiatives that would lead to “bus rapid transit” systems in cities in Africa and Asia. Cooperation with UNEP/GEF could be beneficial to the IEA and its network partners.