



STEPS NEWS LETTER

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Welcome to the second newsletter of the STEPs project!

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The current supply and demand for fuel increases prices

During the course of 2005 there has been a significant increase in worldwide energy prices. Many factors have combined to cause this. A key factor has been the increased demand from the rapidly developing economies of India and China, but there have been other contributing reasons as well such as short term disruption to supplies from the Gulf of Mexico due to the unusually severe hurricane season, restrictions in current worldwide refining capacity and uncertainty in the middle east leading markets to speculate on forward pricing.

The increases in wholesale energy prices have been transferred by the commodity markets into higher retail prices for all fossil fuels, with publicity focusing on petrol and diesel prices.

This highlights the purpose of the STEPs project. Future fuel prices are just one of several important factors which will drive the development and uptake of new technology and the modification of personal travel behaviour in the future. STEPs has been active for nearly two years now. As you will read in more detail later in this newsletter, the project partners have been developing scenarios that combine different pathways for the evolution of future fuel prices, with the impact of transport, land use and technology development policies to estimate the likely impacts on energy use, transport patterns, technology uptake and environmental impact to 2020 and beyond.

This may seem a long way off, but decisions made today will influence the course of our lives throughout this period and so the results of STEPs will be important in informing the strategies that our policy makers take in the very near future.

STEPS (Scenarios for the Transport system and Energy supply and their Potential effectS) is a project being carried out as part of the European Union Sixth Framework Programme, under its 'Sustainable Surface Transport' priority. The work is being done by a consortium comprising 14 organisations with expertise and skills in scenario building, modelling and transport and energy research. The project is managed by Buck Consultants International. STEPs started in January 2004 and is due to be completed in the summer of 2006.



STEPS Workpackage 3: Definition of Scenarios

STEPS Workpackage 3 is concerned with the development of scenarios modelled and assessed in Workpackages 4 and 5. To understand and develop the scenarios the work was divided into four distinct tasks;

Task 1 – Synthesis of trends into dimensions

Task 2 – Definition of the scenarios

Task 3 – Definition of regional impact

Task 4 – Building and formulating the scenarios

Task 1 - The Synthesis of trends into dimensions

The basis for the construction of scenarios was the conversion of trends and developments into dimensions of the transport and energy system and then into quantifiable variables to be used to model the scenarios. Trends and developments were concentrated into five subsystems;

- social economic and cultural
- spatial
- passenger transport;
- freight transport
- transport energy systems.

These subsystems formed the context of the development and implementation of new vehicle and vehicle powering concepts. From the elements of the subsystems a list of variables was developed. Each variable was given a value which would differ depending on the characteristics of the scenario.

Task 2 - Scenario Framework

To create a definition of the scenarios a list of 15 themes was established, these themes were categorized into two dimensions (*Exogenous Variables and Policies*) and then reworked into measures which could be linked to indicators.

Only one exogenous variable was selected: *the availability of energy resources*, Two options have been used for this: A (*the generally accepted energy supply forecast*) and B (*the worst case energy supply forecast*)

Principally three packages of policies were defined. Eventually a fourth option was added in which no policies were implemented to allow isolation of the impact of the fuel price (this is described further on page 4). The values of the policy dimension were: *Group -1: No Policies (just fuel price)*, *Group 0: Business as Usual (BAU)*, *Group 1: Demand Regu-*

lation (DR). *Group 2: Technological Investment (INVEST)* and *Group 3: Mix of Measures*. From this a fifteen cell matrix was constructed for the future of the European Transport and Energy system up to 2030.

Task 3 - Definition of the regional impact

To meet the cultural, political and economical aspects of all regions, the scenarios contained an EU Level general description and a more regional specific description. The regional specification was based on two distinctions; Spatial structure of regions and Planning culture.

Task 4 - Building and formulating the scenarios

Three scenarios were defined within task 4 which were formulated on two levels; Detailed and quantified description and the formulation of information into a suitable format to target a wider audience. To understand the scenarios more clearly the policy groupings were defined as follows:

1. *General Transport Policies*. Scenario 1 – *Business as usual* - This is based on current EU policies which will impact on the transport and energy system in the next 25 years. No great efforts are made in this scenario for mobility management, preventing urban sprawl or stopping the diminishing use of public transport.

2. *Technological Policies*. Scenario 2 – *Technology Investments* - Includes policy measures resulting from direct investments in the infrastructure, technology and innovation systems. The basic scenario used was the Business as Usual case with some investment measures added which concern infrastructure, energy efficiency, skills, knowledge and production capacity of alternative fuels.

3. *Transport Policies*. Scenario 3 – *Demand Regulation* - Focused on the impact of demand regulation on transport and energy systems in Europe. The Business as Usual case was the basic scenario with some demand regulation and taxation measures added concerning taxation of car use, fuel and regulation of urban development. This scenario relied heavily on legislation to promote alternatives and at the same time increase taxes on energy consuming modes. Examples of measures within this scenario include mobility management, taxation on fuels, and decreasing the price of public transport.

STEPS CONFERENCE

The STEPs final Conference focusing on policy level will take place June 2006. Further information regarding the date, location and programme for the day will be posted on the STEPs website as soon as information is available. Please refer to the website (<http://www.steps-eu.com>) at a later date for more information.

STEPS Workpackage 4: Modelling Scenario Impacts

Work Package 4 “Scenarios Impacts” is the core of the research activities. Its objective is to apply modelling simulation to produce forecasts of relevant impacts of the scenarios developed previously in the project (WP3).



Each scenario is an alternative path on which the relevant input variables could develop e.g. the future oil price, the future level of fuel taxes, the efficiency of public transport and so on. In the STEPs project, alternative visions of the future are explored by simulating several scenarios focused on transport and energy supply and the modelling tools allow to simulate their impact and to provide quantitative responses on the effects of such scenarios on various aspects.

Modelling simulation makes use of tools developed to analyse a specific context and provide a simplified description of the real world or, better, of a portion of the real world. In practice, models are built to highlight specific elements and, in the case of the tools used in STEPs, such elements are the transport system, the energy market, the macroeconomic variables, the local economies, the urban development and so on. By applying models, it is possible to simulate the present situation but, above all, it is possible to produce forecasts under specific assumptions concerning a sample of input variables.

Several modelling tools are used in STEPs with different specialisations. On the one side, there are models operating at the European level, i.e. providing a picture of the whole European Union (but in some models also non-EU countries are covered). These models are the POLES model, which simulates the market of energy, the ASTRA model, which simulates the linkages between the transport sector, the economy and the environment, and the SASI model which simulate accessibility and regional economic development. On the other side, there are models operating at the urban/regional level, i.e. representing transport supply and demand and the land use in specific region or metropolitan areas: Brussels (Belgium), Dortmund (Germany), Edinburgh (UK), Helsinki (Finland) and South Tyrol (Italy).

The European models provide overall forecasts concerning elements like the road vehicles fleet, the fuel price, the car-ownership, etc. Urban/regional models are used to look in more details at the effect at the ‘micro’ level: local emissions, usage of private modes, average distance of trips. So, by analysing the forecasts produced by all models, it will be possible to have a comprehensive picture of the impacts of the policies and to compare the alternative scenarios. The outcome of the models will be also used in Work Package 5 for the assessment task.

SOUNDBOARD FORUM MEETING

STEPS is hosting its 2nd Soundboard forum meeting on the 3rd March 2006 in Bratislava. This will provide the opportunity for the members of the soundboard forum to verify the final draft outputs of the STEPs modelling process, and to provide a steer regarding the development of the results at the policy level during the final few months of the project.



STEPS Work package 5.2 - Analysis of Model Outputs

Work is starting on this important task which provides a link between Workpackage 4 and Workpackage 5. Its objective is to provide a comprehensive analysis of the forecast parameters and related impacts, which include transport demand, energy consumption, greenhouse and polluting emissions, regional development, local accessibility etc. It will evaluate the consistency and relevance of the model outcomes and provide information for validation of the results by our group of external experts (the Sound Board Forum).

There is a degree of overlap with WP4 so this workpackage will focus on the comparisons 'between model' outputs and seek to understand the differences and similarities between the regional models and the results for the national models.

The models operate at two different spatial levels. The EU-scale models, POLES, ASTRA and SASI, focus on different aspects of the transport-energy interaction and the five regional models cover a variety of different spatial extents and types. With this variation in models, it would be expected that some variation in model outcomes might be expected even if the models were well integrated. Whilst in principle the three EU-level models could pass down outputs such as car ownership, GDP forecasts and vehicle composition to the regional models, in practice only the vehicle composition was used by all the regional models. Most of the regional models had embedded car ownership models of their own that could be expected to be more accurate than that forecast at an EU level. Among the EU-wide models ASTRA used estimates of car ownership and vehicle composition from the POLES model, whilst POLES used ASTRA's GDP forecasts.

Preliminary results have been received from a number of the models. First, it has been established that the Business as Usual scenarios might well be unsuitable reference scenarios, since they already contain significant policy changes causing a significant trend breach in the results. These policy responses are so strong

that they overshadow the impacts of the fuel price changes: the main current object of interest. In consequence it has been decided to also compile secondary

Cell matrix for the future of the European Transport and Energy system up to 2030	No Policies, Just fuel prices	Business as Usual (BAU)	Demand Regulation (DR)	Technology Investments (INVEST)	Mix of measurements
Unrestricted energy supply	A-1	A0	A1	A2	A3
Energy Scarcity	B-1	B0	B1	B2	B3
Pro-active policy behaviour	C-1	C0	C1	C2	C3

reference scenarios 'no policies, just fuel price' The table above illustrates the scenarios and their coherence. In combination, it was decided to run the yellow (light) scenarios (A-1 through B2) in all models and, if possible, add the blue (dark) scenarios of the '3' column and/or of the 'C' line.

Initial analysis indicates that both a technological focus and a demand management focus could reduce energy use, although by different mechanisms. Technology advances increase the energy efficiency of trip making with little impact on travel whilst the demand management cut travel demand, with little impact on the energy efficiency of the trip making. Early indications from the first model results are that the demand management scenarios, as defined in this study, have a lesser impact on emissions, than the defined technology-driven scenario but have a greater impact on total energy consumption.

Firmer conclusions will be made when full final outputs from all the models have been received.

If you would like to find out more information about STEPs or be kept informed about future events please visit the website <http://www.STEPs-eu.com>

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