

Transport, Energy and Environment

Report on the 3-4 October, 1996 Conference in
Marienlyst, Elsinore, Denmark

This conference was attended by 75 transport economists, planners, and technologists from 15 countries, mainly European.

The conference attendees seem to be bracing for strong CO₂ emissions targets for the transport sector. Some countries, especially those in Scandinavia which have significant hydro and nuclear power where there are no emissions and hence no room for improvements, expect to be hard hit. The talk is for energy efficiency to contribute most of the savings potential, taxes especially on diesel for freight transport to be less important, and modal shifts encouraged by economic incentives to be least important. Some participants even talked about taxing travel.

Trends in Transport Energy and Environmental Constraints

Hans Koch, Director of Technology at the IEA, provided background for the meeting. He noted that transport demand is critical since: (1) It represents 33 percent of energy demand in the OECD and 23 percent in the rest of the world (ROW). (2) It represents the major source of incremental oil demand - 80 percent.

Recent trends in transport include: (1) More passenger transport. (2) More road freight. (3) In spite of the elasticity of demand, CO₂ emissions from transport are rising due to the demand for power cars, more fleets, the rise in vehicle miles traveled, lower car occupancy, the relaxing of speed limits, and increased congestion. (4) There is significant pent-up demand for automobiles in the developing world. The OECD has 494 vehicles per 1000, while the ROW has 23 per 1000. The FSU has 115 per 1000.

Philippe Mathieu of Statoil reviewed the World Energy Conference's transportation project. They developed three scenarios out to the year 2000. The common features of all the scenarios are: (1) The importance of oil demand in the OECD decreases. (2) A shift toward middle distillate use. (3) Small alternative fuels use. The study breaks 1970-2020 into three overlapping policy time-frames: (1) Energy security: 1970-1985, (2) Local pollution, 1980-2000, and (3) Global climate: 1990+.

John Turkson of the UNEP looked at transport issues in Sub-Saharan Africa. To control greenhouse gas emissions the area needs rational investments in road infrastructure and fuel efficient automobiles, not the inefficient used cars obtained from Europe and the United States.

Dirk Scheele of the Netherlands Government discussed the importance of freight transport which takes about 30 percent of energy used in transport. Unlike other parts of transport it is showing increasing energy intensity. The cause seems to be a modal shift in freight from rail toward roads. This, in turn, is attributable to the trend toward higher value and lighter loads that require greater flexibility that only road transport affords.

Manfred Walback of the Julich Research Center in Germany analyzed Germany's pledge to make a 25 percent reduction in CO₂ emissions by 2006 over 1990. He showed that the target will not be reached even with the 50 percent emissions reduction in Eastern Germany as that region

rationalizes its energy use and shuts down inefficient coal burning. (This work could be important because most analysts think Germany supports greenhouse targets since it thinks it can meet them easily.)

Pieter Vander Meiren of the Benelux Association for Energy Economics claims the proper balance between increasing energy use for transport and increased technological efficiency is impossible to determine.

Technological Development and New Transport Systems

Jurgen Willand, Head of Engine Developments at Daimler-Benz, discussed likely internal combustion engine developments. His points included:

1. There is significant fuel efficiency improvement left in the internal combustion engine.
2. Mercedes expects the new car fleet to average no less than 6 liters/100 km by 2005 (40 mpg+). They have prototype models that operate at 3 liters/100 km. He noted that you now could achieve 3 liters/100 km in a Mercedes C200 diesel with a driving style that does not include sharp accelerations or is subject to congestion.
3. Lightweight engine design can save a minimum of 5 percent of fuel consumption.
4. Variable valve timing can add up to a 19 percent savings.
5. Driver influence, driving style, time of day, route selection, gear selection, loading, tire pressure, and speed, can account for variations of up to 38 percent in fuel use for a given driver.
6. Intelligent combinations of spark ignition and diesel technologies will give autos significant improvements in fuel use.

Kaj Jorgenson from the University of Denmark and the RISO Laboratory discussed hybrid and electric vehicles. He showed that the potential efficiency improvements available from the vehicles is about 2 to 1.

Tor Ask of the Norwegian Technical University made a pitch for natural gas vehicles. Norway is experimenting with LNG vehicles, especially buses. They have had good success with lean burn engines. They expect the engine cost, currently more costly than diesel, to be comparable once economies of scale sets in. Most of the audience expects gas to only fill niche markets.

George Erdmann from Berlin Technical University envisions a fuel cell with 40 percent efficiency. They are currently doing life cycle analysis and examining market barriers and sensitivities. Germany and other European countries have a sizable methanol business and, in some countries, gas stations when they replace leaded fuel, will have an available pump and storage tank for use to sell methanol.

Lee Schipper of the IEA (and LBL) presented his work on mobility. He noted that:

1. Auto ownership and GDP are highly related.
2. The gap in auto efficiency among OECD countries is narrowing.
3. Auto fuel costs/km have *declined in real terms* in every OECD country.
4. The increase in travel activity is the largest contributor to CO₂ emissions.
5. In the U.S. only 50 percent of work trips are made by car.

6. Work trips are not growing, only other trips.
7. The average trip length is 12.6-15 km and 60 percent are less than 10 kms.
8. The U.S. travel, by purpose, is significantly higher than in other countries, but the mileage by purpose (work, social, recreational) is similar for all countries; only travel for family and civic purposes (including shopping) is higher in the U.S.
9. Car travel per capita in the U.S. is twice that of Europe.

Hans Andersen of the Danish Technological Institute showed that telecommuting (distance working) reduces transport and saves energy, but the savings is only of minor importance because of offsetting trips during nonwork hours.

A study of land use by Olav Hauge of Asplan Viak (Norway) concluded that neither municipalities nor transport ministries choose the optimal land use solution.

Megacities: Solutions to the Transport and Air Pollution Problems as a Precondition for Economic Development

Mariano Bauer of the University of Mexico discussed Mexico City's air pollution problem. Mexico City, built on a plateau surrounded by mountains with weak prevailing winds, has many of Los Angeles' problems, but they are way behind in implementing solutions. He noted that: 50 percent of energy use is transport; 75 percent of air emissions are due to transport; cars have low passenger occupancy; the average speed is 36 km/h (22 mph); the METRO only represents 14

percent of trips; the Minibus is the preferred public transport; ozone and particulate emissions are 3 times the national standard; other critical pollutants are under the national standard; the auto fleet is aged: only 30 percent are 1991 model year or newer (when catalytic converters were introduced); half of the gasoline is unleaded (they have introduced RFG); the average trip is 42 minutes; with the average trip to work in excess of an hour. This represents \$2.3 billion/year in lost wages due to transport times in excess of a 35 minute worldwide benchmark standard.

Ranjan Bose of the TATA Research Institute in India presented transport developments in megacities since 1950. Vehicles have increased ten-fold, while urban population has gone up 3.5-fold and total population only 2-fold. He noted that developed countries' strategy for sustainable growth is to focus on stability via state-of-the-art technology while developing countries opt for cost effective solutions, not necessarily state-of-the-art technology.

Effectiveness of Public Policies in Transport

Alexandra Katz of Statistics Norway found no significant causal relationship between public transport and productivity in the economy.

Niels Kristensen of COWI Consultants in Denmark calculated a strong welfare gain from stabilizing CO₂ emissions at 1988 levels by the year 2005. This seemed to differ from other work that showed a welfare loss.

Tony Finizza

London Week, 1996

The first week in December is traditionally the time when the European Affiliates of IAEE gather in London. The key event is the annual BIEE/IAEE/RIIA (Royal Institute of International Affairs) conference; the first of which took place exactly a decade ago. This year the eleventh conference, *Controlling Carbon and Sulphur: International Investment and Trading Initiatives*, took place in the refurbished home of the RIIA, Chatham House. A report on the proceedings of the conference appears elsewhere in this issue. This conference goes on record as one of the most successful in recent years with 270 attending from over thirty countries and including more than fifty representatives of major business corporations.

Through the support of the EFCEE, it was once again possible to assist delegates from IAEE affiliates in Eastern Europe to attend the conference on Thursday and Friday, 5-6 December and to take an active part in the administrative meetings over the ensuing weekend as well as to present the East European Workshop on Monday, December 9th (see report elsewhere in the *Newsletter*).

To be able to participate in the entire program, EFCEE delegates had to be in London for one week, arriving on Tuesday or Wednesday, 3/4 December and departing on Tuesday or Wednesday the following week, depending on the dates their national airline flew into London. However, the costs of accommodation and travel are kept to the equivalent of a three day visit (as incurred by all conference attendees) by the now well established practice of housing the EFCEE delegates with families in West London.

The venue for the weekend meetings centered on Hyde Park Corner. On Saturday, under Chairman Ulf Hansen of Rostock University, Germany, the Executive Committee of the EFCEE met at the Royal Air Force Club in Piccadilly - to review events in Europe in 1996 and prepare proposals for 1997. The Executive Committee was joined by other delegates and BIEE members at the Club later in the evening to enjoy the BIEE dinner for the visitors, hosted by Tony and Mary Scanlan.

On Sunday morning, on the other side of Hyde Park Corner, the main meeting of the Euro-Affiliates took place at the Caledonian Club, the elegant London offshoot of the Caledonian Club in Edinburgh, with its unmistakable Scottish flag, the blue and white cross of St. Andrew over the entrance. Twenty delegates from 14 of the 23 Euro-Affiliates debated a wide range of issues from 10:30 through a working lunch to 16:00. The final item was a presentation from the Netherlands by Frits van Oostvoorn on the *convergence* of energy policies and standards in Eastern Europe towards those in the nations that make up the European Union.

It was agreed that the next meeting would take place on the occasion of the forthcoming Vienna European Energy Conference in early July.

Tony Scanlan

BIEE Council Member and EFCEE Executive Committee

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