



Conclusions and Key Findings

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Workshop 3
Reducing CO₂ Emissions in Goods Transport
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Messages of Workshop 3 (Freight and Logistics)

I Situation and trends

- **Status quo observation**

Freight transport and logistics are responsible for about one third of the carbon footprint of transport with a strong tendency to grow further. As freight transport is related to trade and global exchange the „natural“ growth rate exceeds that of GDP such that a decoupling from GDP is difficult although not impossible.

- **CO₂ implicitly included in company planning**

Firms try to plan their logistics efficiently, considering the rising costs of fuel. There is eventually a correlation between a firm's aim to reduce costs and the social goal to reduce CO₂. Nevertheless a substantial potential can be identified to increase carbon efficiency at the individual firm level as well as through cooperation between logistic players.

II Potential actions of logistic players

Firms can reduce CO₂ emissions through using better technology, improving logistic concepts and operations or employing alternative modes of transport. Technological innovations include more fuel efficient engines, aerodynamics, weight and tyres. In the short run the contributions may be modest, while in the longer run stronger innovations can be expected if oil prices increase and the R&D activities of truck manufacturers intensify. A major technological leapfrog through hybrid technology or hydrogen based propulsion can only be expected in the long run.

Education of drivers (eco-driving) can contribute to fuel savings. Optimisation of tour planning, increase of loading factors and better consolidation of consignments will lead to less vehicle kilometers and associated fuel consumption. Modal shift to railways, IWW and coastal shipping presupposes an adequate logistic quality of alternative modes, which in general is only possible on long distances and for high transport volumes. Commercially oriented railway companies might be able to develop and become predominant players on European corridors, in particular for seaport-hinterland transport.

Companies prefer to plan their logistic concepts and operations independently because they regard logistics as a part of their market strategy. The increase of transport and logistic costs might give rise to a change of such stand-alone strategies. A further consolidation of supply chains can be achieved through new alliances between forwarders, haulage companies and the shipping industry. This can result in a substantial reduction of vehicle kms compared with a stand-alone optimisation of company logistics. It can reduce the volume of direct delivery activity and just-in-time service as well lower inventory holding.

III Political Instruments and Voluntary Agreements

- **First-best instrument for CO₂ reduction**

A global CO₂ emission trading system is a first-best solution from the economic point of view. In such a world-wide regime, which would include all economic sectors, the market would decide on least cost strategies. The contribution of the freight transport sector to CO₂ savings would result from market processes. Most probably the costs of mitigation of CO₂ emissions in the transport sector come out higher compared with other sectors like energy supply, manufacturing or households such that a lower contribution would be required from freight transport. In some studies a reduction of 10% in the transport sector until the year 2020, compared with 1990, is regarded as a big achievement. As all sectors would be included in a trading scheme, aviation, maritime and inland waterway transport would also have to contribute. These are presently free of carbon-related taxes because of international agreements.

There are a number of institutional problems arising from such a scheme, because the critical points for its effectiveness are the fixing of periodical caps and the allocation of allowances. Although it is possible that the system is discussed and developed further in the course of developing a post-Kyoto agreement it seems improbable that it can be workable in the medium term.

- **Second best strategies**

Second-best strategies include all kinds of partial policies to tackle the climate goal (taxes, charges, regulations, standards, investment in alternative modes). A first example is partial emissions trading schemes, for instance including aviation and eventually maritime or

inland waterway transport into the Emission Trading Scheme (ETS) of the EU. Another type of partial policy is the setting of obligatory standards for the CO₂ emissions of the truck fleet, comparable to the 120 g/km policy for cars of the European Commission. This policy towards cars faces a number of problems including agreeing a penalty scheme. In the case of trucks the complexity will be higher.

In Japan the „Top Runner Concept“ has proven a successful strategy to stimulate firms to apply environmentally best technology. The best vehicle in class pays the lowest tax today and moves to a medium tax class in the future. In Europe a similar effect could be achieved if CO₂ emissions could be introduced in the forthcoming Euro 6 standard for vehicle emissions. In this case CO₂ emissions could be used for differentiating charges according to Directive 2006/38 for charging heavy goods vehicle on motorways. It has been observed in Germany and Switzerland that the differentiation of charges on the base of Euro categories has a substantial influence on the purchase of new vehicles. Haulage companies have jumped from Euro 3 to Euro 5, while Euro 4 is not preferred because the vehicles are charged a higher rate than Euro 5.

Pure and rigid regulation policies have to be regarded with care. In many cases such policies, which may for instance include sector specific transport bans or obligatory use of environmentally friendly modes, induce undesired side effects.

The state can also intervene through appropriate investments. Provision of ITS infrastructure for example contributes to a better management of bottlenecks in road infrastructure and improves the reliability of transport services.

Second-best policies face two problems: (1) It is necessary to define a reduction target for the freight transport sector or to quantify its external costs reliably. (2) International harmonisation is necessary to avoid differences of environmental treatment that could lead to counterproductive arbitrage practices (e.g. outsourcing or outflagging).

Companies are increasingly interested in demonstrating their CO₂ performance to customers, NGOs and the State, such that voluntary actions will become a most important element of climate policy. They can contribute to reduce the intensity of measures like taxes, charges or regulations. Possible platforms are ISO 14064 and NTM. Carbon auditing and benchmarking are further measures to improve the company's environmental image.

DHL gives a best practice example for voluntary action of the industry by setting a CO₂ reduction target for the company (including the suppliers involved) of 30% to 2020, based on 2007 emissions. Other companies have started with similar entrepreneurial strategies, making carbon reduction a management goal and thus creating management

incentives for small savings that result in substantial achievements overall.

IV Cost Effectiveness

- **Data availability and measurement problems**

A common and high standard data base as well as widely accepted measurement methods are important to set reliable benchmarks for controlling emissions and to make yardstick competition of companies possible. Until now these preconditions are not met, and estimations of CO₂ emissions of freight transport activities are unreliable. This makes it most difficult to compare the results of best practice reports and to develop a ranking list of measures according to cost effectiveness.

- **Short, mid and long-term measures**

Short-term measures include voluntary agreements, ecodriving, and reinforcing existing business strategies to save energy. Transferring best practices like the Japanese Top Runner Programme can also be implemented within a few years. Other examples are changes of vehicle taxation to include carbon emissions in the scheme, for example in the forthcoming definition of EURO 6 truck emissions standards in the EU, and differentiation of infrastructure charges based on Euro class.

Mid-term measures could include modest technological changes, city road pricing, extension and completion of interurban road pricing concepts (incomplete road pricing systems, including only motorways or heavy goods vehicles have little impact on bottlenecks) or the integration of railways into supply chains. New cooperation concepts, as in the case of logistic alliances, need several years to be developed and implemented. Such changes presuppose a very careful rethinking of present strategies.

Long-term measures include technological innovations (hybrid technology, hydrogen-based propulsion systems), change of logistic networks (warehouses, inventories, supply chains) and basic changes of the spatial production patterns. The state can foster such developments by supporting R&D and pilot projects.