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TRANSPORT AND ENVIRONMENT

REVIEW OF CO2 ABATEMENT POLICIES FOR THE TRANSPORT SECTOR

Conclusions and Recommendations

This document was examined under item 4.2 "Sustainable Transport Policies - Specific Topics: Transport and Environment" of the Agenda for the Dublin Council of Ministers.

Ministers noted the report and agreed to the thrust of its conclusions and recommendations.

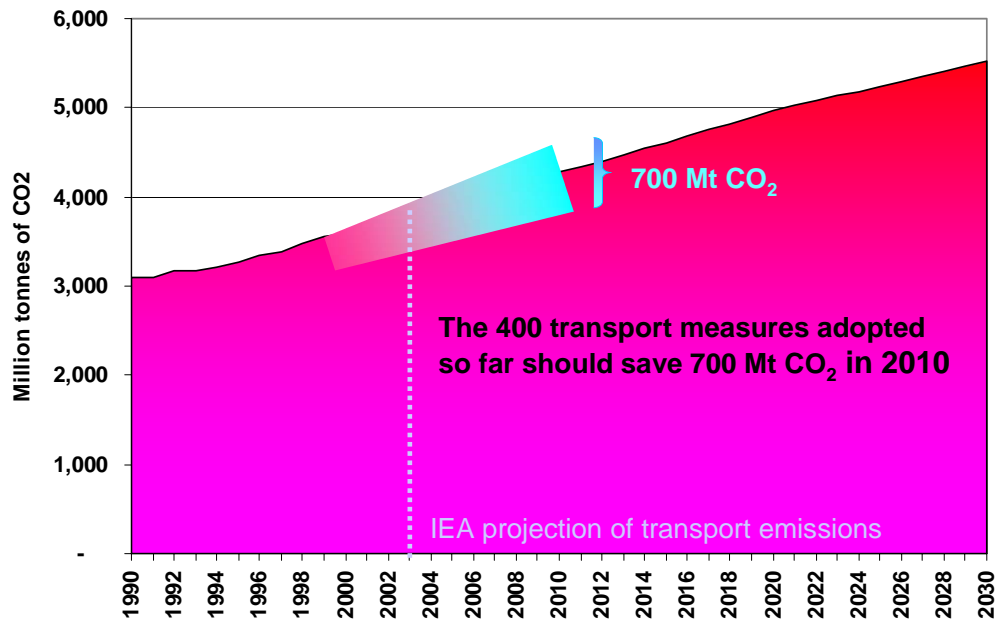
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REVIEW OF CO₂ ABATEMENT POLICIES FOR THE TRANSPORT SECTOR

CONCLUSIONS AND RECOMMENDATIONS¹

Introduction This report reviews the progress ECMT and OECD countries have made in reducing transport sector CO₂ emissions and makes recommendations for the focus of future policies. National communications under the UN Framework Convention on Climate Change and other recent policy statements were used to assemble a database of over 400 abatement policies introduced or under development. This reveals that transport sector CO₂ emissions steadily increased over the last ten years despite significant efforts to cut them in some countries. Assuming real household disposable incomes continue to grow at a faster rate than the real cost of transport this trend is likely to continue. Slowing the growth of transport sector CO₂ emissions would require more government action and an increasingly pro-active role from transport sector industries in improving energy efficiency.

OECD / ECMT Transport Sector Emissions and the Potential Impact of Policies Identified



Source: ECMT, based on World Energy Outlook 2004, IEA.

1. Report prepared by the ECMT Group on Transport and the Environment in co-operation with the OECD Environment Policy Committee's Working Group on Transport.

Analysis of the database suggests that measures so far adopted might cut 700 million tons from annual CO₂ emissions by 2010, just over half the projected increase in emissions between 1990 and 2010. The accompanying figure gives a crude indication of the significance of these savings, although some of the measures identified may have been included in the business as usual projection shown and the slope of the curve incorporating CO₂ savings is difficult to determine. Based on an analysis of the policies reported by national governments, official assessments of the effectiveness of national policies, and the more theoretical considerations examined in the report submitted to Ministers, CEMT/CM(2006)15, the following conclusions are drawn.

How much should transport contribute

Cost-effectiveness (cost per tonne of CO₂ abated) is the fundamental determinant of which abatement policies to adopt and how much the transport sector should contribute towards economy-wide CO₂ abatement goals such as the 2008 – 2012 targets for Kyoto Protocol Annex I countries. It is important to achieve the required emissions reductions at the lowest overall cost to avoid damaging welfare and economic growth. Costs are minimised when the cost of saving an extra ton of CO₂ is more or less equal for all measures in all sectors. Some of the potential measures for the transport sector have relatively low costs, others very high costs at the margin. This is also true of other sectors. By far the largest relatively low cost emission reductions are expected to be achieved in power and heat production. Transport and most other sectors are therefore expected to contribute correspondingly less to overall emissions reduction strategies. Nevertheless, the low cost transport sector measures identified below need to be implemented.

Cost-effectiveness

Carbon and fuel taxes are the ideal measures for addressing CO₂ emissions. They send clear signals and distort the economy less than any other approach. Fuel taxes already exist in all member countries and whilst changes in tax rates are sensitive politically, because they are highly visible, developing substitute policies usually increases costs significantly. Within the transport sector, policies currently tend to focus on some of the higher cost measures available, for example subsidies for biofuels, whilst some low cost measures are neglected. The focus should now switch to the lower cost options identified in the report submitted to Ministers, notably: regulation and labelling for some vehicle components, such as tyres, not included in standard tests of vehicle efficiency; support for eco-driving and for improved freight logistics; better use of differentiated vehicle taxes, particularly in markets where stringent but voluntary emissions standards apply; tightening of vehicle emissions standards in regions where they are relatively weak in order to benefit from the technology already developed for markets elsewhere; and as noted, fuel taxes.

Co-benefits

Many of the measures that reduce CO₂ emissions from transport are also sometimes proposed for improving the security of oil supply. Since

road transport accounts for the largest part of oil product consumption in the economy such oil security measures focus increasingly on road vehicles and alternative fuels (notably biofuels and hydrogen). Some policies pursued primarily for mobility goals – congestion management and access to public transport for the purpose of social inclusion – can also yield CO₂ emissions reductions. Prioritising policies that yield co-benefits makes sense but is not a reason to ignore cost-effectiveness.

Fuel efficiency delivers most

The largest CO₂ abatement opportunities in the transport sector lie in initiatives to improve energy efficiency: improving the rated fuel efficiency of new vehicles as measured by vehicle certification testing; improving the efficiency of components and accessories not covered in current test procedures; and improving on-road vehicle performance. The most cost effective options include promoting fuel-efficient driving through training and feedback instrumentation, incentives for car buyers to choose lower emissions vehicles where stringent but voluntary emissions targets have been agreed with car manufacturers, and regulations for some currently unregulated vehicle components. No country has exploited all of the opportunities available. There is an optimal rate for improvements in energy efficiency, not easy to determine as the costs of the technology available are difficult to estimate – they generally start high and come down over time. Determining the appropriate level and rate of tightening for vehicle emissions standards is therefore complicated. Regulations for currently unregulated components could however steer the market to greater fuel economy at very little cost, for example by promoting the best performing tyres among those already available.

Differentiation of vehicle taxes top priority for Europe

Reform of vehicle taxation (purchase, registration and annual circulation taxes), so that it is based on a vehicle's specific CO₂ emissions and strongly differentiated, should be a top priority in Europe. This will maximise the abatement potential of existing voluntary CO₂ emission targets. Governments that have already differentiated taxation in this way are recommended to evaluate the effectiveness of their measures with a view to providing stronger incentives covering a broader range of the better performing vehicles (not just ultra low emission vehicles) to encourage sufficient numbers of consumers to purchase more efficient vehicles. Basing differentiation directly on CO₂ emissions in place of proxies such as engine size is also recommended.

Vehicle components

Vehicles components that are not tested for efficiency in certification procedures, such as tyres, air conditioners, alternators, lubricants and lights should be tested and labeled. There are large differences in efficiency between equivalent components currently on the market. Regulatory standards can be designed to steer consumers and manufacturers to the better performing components at low cost and can be designed also to promote technological improvement. An industry proposal for standards for energy efficient tyres is provided in the report

submitted to Ministers. Tax incentives can be used to complement standards and can also be used to promote the uptake of non-standard equipment designed to improve fuel efficiency such as tyre inflation monitoring systems.

Fuel-efficient driving and logistics

Initiatives to promote fuel efficient driving, particularly through training programmes for both car and truck drivers offer significant cost-effective savings. In the freight sector these initiatives can usefully be coupled with voluntary programmes to improve both logistic organisation and driver behaviour. (Electronic km-charges for road use by trucks also provide strong incentives for more efficient logistic organisation – see below). For cars, tax incentives for fitting fuel efficiency feedback devices such as econometers and shift indicator lights proved highly effective in an extensive Dutch program at the beginning of the decade.

Vehicle fuel efficiency standards

The USA, Japan and China regulate passenger car fuel efficiency, and Japan also regulates heavy duty vehicle fuel economy. The EU and its Member States together with Switzerland, Australia and Canada all employ voluntary targets for car manufacturers and importers. Japan has by far the most ambitious regulatory standards, but the EU voluntary targets are of a similar order. US standards are far less ambitious, with the exception of the new standards adopted by California in 2006. Regulatory and voluntary targets will need to be progressively tightened to maintain their value. Clearly the weaker targets can be brought closer to the tighter existing targets, despite differences in the types of vehicles on sale in each market. There will also be scope for tighter targets and standards in Europe and Japan as technology improves. The issue is the appropriate time scale for achieving new standards. Any tightening of targets in Europe should, however, go hand in hand with more differentiation of vehicle taxes, as set out in the 1995 Joint Declaration between ECMT, OICA and ACEA on CO₂ emissions from new passenger cars.

Heavy Duty Vehicles

Few governments have targeted the fuel efficiency of light and heavy trucks with these policies. For heavy duty vehicles, fuel is a major item in operating costs and fuel efficiency is therefore an important factor in the choice of vehicles purchased. The market thus already drives improvements but the smaller operators face cash flow and other constraints that limit their ability to respond to fuel price signals. Because a substantial and growing proportion of transport CO₂ emissions are accounted for by trucks, Japan began regulating emissions from heavy duty vehicles in 2006. All governments are encouraged to monitor the costs and benefits of the Japanese standards to determine if a similar approach would bring benefits in other countries.

Vans

Fuel accounts for a smaller proportion of overall costs in operating light commercial vehicles. A number of Governments have adopted standards for the fuel efficiency of government owned vehicles and the

US has extended CAFÉ standards to light trucks. There may be an opportunity to target a larger number of vehicles by extending voluntary and regulatory standards in other countries to all light commercial vehicle models. A voluntary agreement with manufacturers in this respect was identified as a priority under the first European Climate Change Programme in 2000 but has not so far been developed.

Biofuels

Policies to promote biofuels are prominent in national emissions abatement strategies. Biofuels offer potentially significant CO₂ abatement opportunities, but at a high cost with all conventional feedstocks excepting ethanol from sugar cane. The next generation of biofuels, utilising cellulose and lignin rather than just sugars and oils to produce fuels, may offer higher levels of abatement at lower cost although much uncertainty remains. Government incentives for biofuels should be tied to well-to-wheels CO₂ efficiencies. Thus preferential tax rates, subsidies and quotas for biofuel blending should be calibrated to the benefits in terms of net CO₂ savings associated with each fuel. Development of an index of CO₂ savings by fuel type would be useful and if agreed internationally could help liberalise markets for new fuels. Indexing incentives would also help avoid discrimination between feedstocks. Subsidies that support production of specific crops risk being counterproductive to emissions policies in the long run. It should also be noted that biofuels of all types yield the largest and most cost effective CO₂ emissions reductions when the biomass from which they are produced is employed to displace electricity production from fossil fuels, rather than transport fuels which require secondary processing and distribution.

Hydrogen

Hydrogen fuelled transport technologies attract significant research and development funds but they are not a CO₂ abatement policy option for the short or medium term. Hydrogen has to be produced using non fossil fuels (nuclear electricity, biomass or other renewable power) if it is to achieve CO₂ abatement. As with biofuels, abatement is maximised when these energy sources are employed directly for displacement of fossil fuelled electricity generation.

Policy mix

Examination of policies for CO₂ emissions reduction in the transport sector so far adopted by OECD/ECMT governments, in terms of the number of policies being pursued, reveals that countries place improving fuel efficiency and modal shift on an equal footing. Policies to promote alternative fuels have also been given a prominent role, while reducing demand for transport is largely ignored.

Modal shift

The large number of modal shift policies is believed to be the result of following a “co-benefits” approach to CO₂ abatement policy. That is, governments have selected abatement policies that also contribute to the achievement of other transport policy goals or wider objectives beyond the transport sector. This includes providing access to low cost public transport and reducing congestion. This is a valid approach to

public policy and, indeed, was part of the recommendations of ECMT's 1997 review of CO₂ emissions from transport. The present situation may, however, reflect an over-emphasis on the co-benefits approach. Modal shift policies are usually weak in terms of the quantity of CO₂ abated and have generally been inadequately assessed in national communications on CO₂ emissions policy. Modal shift measures can be effective when well targeted, particularly when integrated with demand management measures. They can not, however, form the corner-stone of effective CO₂ abatement policy and the prominence given to modal shift policies is at odds with indications that most modal shift policies achieve much lower abatement levels than measures focussing on fuel efficiency.

Core inland transport policies

It is therefore recommended that policies now focus on fuel-efficiency: for vehicles, vehicle components and on-road vehicle operation. Policies to promote alternative fuels carry a high cost and a modal shift, co-benefits dominated approach appears unlikely to achieve sufficient abatement in the transport sector. Whenever additional opportunities to reduce CO₂ emissions from the transport sector are sought, a first step should be to investigate whether the potential for improved fuel efficiency has been fully exploited, including through the use of fuel and carbon taxes.

Fuel taxes and emissions trading

Fuel tax increases and specific fuel carbon taxes are estimated to have had a powerful impact on emissions in the small number of countries reporting them as part of CO₂ policy, though of course all member governments employ fuel taxes to raise revenues. They have the highest impact of any of the reported CO₂ abatement measures. Political sensitivities currently prevent many countries from using fuel taxes to influence CO₂ emissions, despite their effectiveness. The potential of this approach needs to be kept under review, particularly as implementation costs are much lower than for substitute approaches, including schemes that trade emission permits.

Road pricing

The official estimates for the impact of the electronic truck km-charges introduced in Europe and the London Congestion Charge suggest they have significantly reduced emissions. Truck km-charges provide strong incentives to rationalise distribution systems and logistic organisation. Electronic charging for road use is expected to spread, albeit with the primarily aim of ensuring foreign vehicles contribute to road costs and managing congestion.

Traffic management and urban planning

Traffic management measures including congestion charges, traffic guidance systems and parking policies have an influence on CO₂ emissions but are not generally reported by national governments to be part of their CO₂ emissions policies. The same is true of efforts to integrate spatial planning with transport policy, which is fundamental to managing traffic growth without restricting the access to services that mobility provides. This appears mainly to be a consequence of the

division of responsibilities between central and local government. Analysis to clarify the potential role for local government policies in reducing CO₂ emissions from transport appears warranted, even though fuel efficiency should remain the primary focus of national policy.

Walking and cycling

Policies towards walking, cycling and improving the urban environment to make non-motorised modes of transport safer, quicker and more attractive, are also neglected in national CO₂ policy reporting. They are an important part of policies to manage the demand for motorised transport and therefore influence CO₂ emissions. A small number of national governments do provide support to local governments to promote walking and cycling and include this support in reports on national CO₂ policies.

Maritime shipping

While shipping emits relatively low emissions of CO₂ per tonne km transported, ships nonetheless emit significant quantities of CO₂. Delegation of responsibility for reducing emissions to the UN International Maritime Organisation has not yielded many results so far, although guidelines on CO₂ indexing were agreed in 2005, incorporating both operational and ship design factors. Negotiations in the IMO have not yet begun to look at potential measures for reducing emissions cost effectively. It is recommended that maritime countries consider policy measures to reduce unitary CO₂ emissions from ships, building on the IMO CO₂ index. Harbour or fairway fees differentiated to promote the use of efficient engines are the tools most readily available.

Aviation

Aviation faces a similar situation. The UN International Civil Aviation Organisation was delegated responsibility for developing policies to reduce emissions from international aviation under the Kyoto Protocol. The difficulty of attributing these emissions to specific countries means they are not counted as part of national greenhouse gas inventories. So far ICAO member countries have not been able to agree on any concrete greenhouse gas abatement policies. They have, however, endorsed the concept of an open, international emissions trading system implemented through a voluntary scheme, or incorporation of international aviation into existing emissions trading systems. The European Commission has adopted a Communication indicating that it considers the incorporation of aviation into the European Union Emissions Trading System to be the best way forward. It aims to make a legislative proposal by the end of 2006. The total amount of allowances to be allocated to the aviation sector and the method for allocating allowances between operators will be key aspects in determining the effectiveness of emissions trading for reducing CO₂ emissions from aviation. A fuel tax (or CO₂ differentiated landing or km charge) would be less costly to operate and avoid problems in determining the initial allocation of permits.

Short and long term strategy

For the short and medium term, policies that target fuel efficiency offer most potential for reducing CO₂ emissions. The most effective measures available include fuel taxes, vehicle and component standards, differentiated vehicle taxation, support for eco-driving and incentives for more efficient logistic organisation, including point of use pricing for roads. For the long term, more integrated transport and spatial planning policies might contain demand for motorised transport. Ultimately higher cost energy sources, including clean energy carriers such as hydrogen and electricity, produced from renewable energy sources, or from fossil fuels with carbon sequestration and storage, will be required if there are to be further cuts in transport sector CO₂ emissions. Major R&D programs will be required to bring these technologies to commercial viability.