



Conclusions and Key Findings

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Workshop 4 Transport CO₂ Emissions in Emerging Economies

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Development imperative

Adequate transport infrastructure and services are essential for economic development and improving welfare. As developing countries grow, transport activity will also grow. This growth should be welcomed but steered to take a more sustainable path than would be the case without intervention from government to provide a planning, regulatory and pricing environment that promotes welfare for all citizens. This includes improving air quality and road safety, and managing congestion. These local problems likely will, and probably should dominate the agenda of governments in emerging economies but policies to address them also provide opportunities to mitigate CO₂ emissions.

Private Motorised Transport Fleet Growth

Car ownership has entered a phase of exponential growth in the largest emerging economies. Regulating for cleaner fuels and for all new cars to be equipped with catalytic converters will be essential to improving air quality. Regulating fuel efficiency will be essential to containing growth in CO₂ emissions and fuel consumption, with the balance of payments implications that has for most emerging economies. Auto fuel is untaxed and indeed subsidised in many middle and low income countries. This kind of support to business and to low income families is financially unsustainable, as recent oil price increase have demonstrated, and inflates fuel consumption and CO₂ emissions.

The fuel economy of new cars sold in emerging economies is relatively high. In India and China the average performance of new cars already matches or exceeds the US targets for 2020. This is mainly because of the small size and low power of the cars in developing countries. In turn this reflects fuel pump prices that are higher relative to incomes than in OECD countries (despite fuel subsidies).

Fuel economy is clearly important to consumers and they can be assisted in making the best choice of car by vehicle testing and labeling schemes. Brazilian car manufacturers have recently entered into a voluntary agreement with the government to begin testing popular ranges of vehicles for fuel economy and provide information to consumers at sales outlets. Testing facilities exist in other emerging economies but have not been used as yet to measure fuel efficiency, concentrating on exhaust emissions. There is scope for governments and independent associations, such as automobile clubs, to develop testing and labeling schemes to “mobilise the demand side potential”. Driving in heavily

congested traffic and on poor roads, characteristic of many developing countries, increases fuel consumption greatly and therefore specific tests for fuel economy that reflect these conditions may be required to ensure the information provided is reliable.

Ownership of auto manufacturing is increasingly global but markets differ widely. The technologies currently being developed in the US, EU and Japan for fuel efficiency are suited to high power vehicles and come at a cost that is much higher in relation to car prices in emerging economies than in OECD countries. The technology solutions for improving fuel efficiency in the short term are therefore different in emerging economies. Idle stop-start systems offer the most cost effective savings in emerging country conditions, because of the extent of congestion in urban areas². Small electric vehicles with limited range for urban areas might also be suited to conditions in the emerging economies. In the long run, engine downsizing in OECD markets and increasing incomes in developing economies will drive a degree of convergence. Despite the differences in technology, the approach for governments to promote fuel efficiency is universal: fuel economy standards to reduce commercial risk for car manufacturers producing fuel efficient vehicles; complementary tax policy³ to steer technological improvements towards increasing efficiency rather than power. Regulatory standards can also be designed to discourage up-sizing of the fleet as is the case in China. Fuel tax policy is an important factor and can also influence the pattern of imports of second hand cars, which supply a large part of the market in many developing economies. Ending fuel subsidies is difficult, especially in periods of high fuel prices, but inevitable.

Motorised two and three wheelers are a major part of traffic in many emerging economies, and they are less readily susceptible to the demand management measures discussed for cars below. They are important as they provide essential mobility to families on modest incomes, but they are also the source of serious local air pollution, even if their CO₂ emissions are modest. Some Chinese cities limit the number of motorcycle registrations, and the country produces 15 million electric bicycles a year as a locally clean alternative. These nevertheless add to power demand from a coal based, CO₂ intensive, electricity industry. In these circumstances an electric bicycle is associated with a similar level of CO₂ emissions per km driven on well-to-wheels basis as a good petrol driven motorbike. In India the Tata Nano car is aimed at the more affluent end of the

². These systems are also cost-effective in OECD countries but the largest gains in efficiency in high income countries over the next two decades will come from downsized engines with turbo-chargers.

³. Tax on vehicle ownership and road use differentiated according to fuel efficiency rating.

motorcycle market, with much improved safety compared to transporting families on motorcycles one of its attractions. If it, and similar low cost cars, proves a commercial success it will accelerate the already rapid growth in car fleets in emerging economies.

The freight transport sector is showing rapid growth of road haulage and erosion of the share of rail and waterway traffic. Trucks generally have poor fuel efficiency and emit high levels of air emissions. Reduced diesel tax rates, aligned with tax on kerosene for cooking and heating, should be ended to provide incentives for more fuel efficient vehicles and more efficient logistics organisation. Taxes on imported used vehicles can be differentiated to eliminate the worst performing trucks. For cars, trucks and buses, inspection and maintenance programs have proven effective in reducing air emissions and maintaining design fuel-efficiency.

In rural areas road infrastructure development is driving rapid motorisation of transport. India plans to connect all its villages to all-weather roads by 2012. Carts pulled by animals are often replaced by locally produced, three wheelers. The impact on CO₂ emissions will be significant.

Demand Management

The rapidly expanding cities of the emerging economies pose a major challenge for mitigating CO₂ emissions and present the greatest opportunities for curbing emissions growth. Car ownership is increasing most rapidly in the cities. The pattern of land use determines transport demand, and transport infrastructure development plays a major role in determining land use. Integrated land use and transport planning is therefore critical to shaping transport demand and promoting the kind of compact urban development, served by public transport, that enables large numbers of people access to jobs and services without reliance on the most fuel intensive, CO₂ intensive and polluting kinds of motorised transport.

Land use planning on its own is, however, a relatively weak instrument, vulnerable to the pressures of property speculation, encroachment and squatting. Restrictions on land use may unduly distort property prices, with undesirable allocational and distributional consequences. The main source of income for many local authorities is from leasing land for new development. Land use policies are insufficient to manage demand for road space if road use and parking are free of charge. When road and parking space go un-priced, excess demand is inevitable in densely populated cities with rising incomes. Road pricing and parking charges are not the preserve of OECD countries as the most

successful and technologically advanced urban congestion charging system operates in Singapore. It was first introduced as a simple paper permits system for access to the city centre, deployed early in development of the city. It has evolved in scope and technological sophistication to keep pace with rising levels of traffic. A road pricing system was designed for Hong Kong a number of years ago and although not yet implemented this might provide a model for other cities in China. In Latin America a number of major cities are considering introducing urban tolling.

Singapore also manages car ownership by auctioning permits, a system already adopted in Shanghai.

Parking charges, with enforcement of parking regulations, are a much more widely applicable instrument for managing demand for road space, and are quite effective in inducing a modal switch to transit (see section 3). Parking policies proved critical in managing the rapid increase in car ownership in transition economies in Central and Eastern Europe. Some Japanese cities require proof of off road parking space for registering cars and this system might be adopted elsewhere. More generally policy towards parking should be made explicit. Some cities in OECD countries have required new dwellings and offices to be built with off road parking, only to find this encourages car use; others have restricted provision of off-street parking in residential buildings and taxed office parking space in order to discourage car use. Policies need to be consistent to achieve predictable outcomes.

Expertise on demand management resides chiefly in local authorities rather than central government. Overseas development aid from donor countries and the technical assistance programs of international finance institutions should direct resources to making this expertise available to counterparts recipient countries.

Public Transport

In some emerging economies, notably India, rapid urbanisation has been accompanied by a decline in public transport services, exacerbating the expansion of private motorisation. Elsewhere, public transport investments have greatly improved urban mobility and move more passengers per ton of CO₂ emitted; Curitiba and Bogota are notable examples of cities that have developed bus rapid transit systems, which are many times cheaper and more flexible than many rail systems. Integrated ticketing systems that facilitate interchange between BRT, local bus and rail systems are effective in promoting use of public transport. The timing of investments in public transport is critical because rising incomes permit an exponential growth in motorised vehicle ownership. Generally

the earlier the investment the more successful it will be in managing private road traffic growth. Once a city is dependent on private motorised transport it is difficult to create a market for public transport. International Financial Institutions can play a critical role in funding public transport in the early stages of urban expansion. They can also provide critical technical assistance in establishing sustainable financing frameworks, through fare revenues and subsidies that provide for adequate maintenance of vehicle fleets, without which public transport systems rapidly deteriorate.

The International Financial Institutions can also have a critical role in supporting governments develop the institutional capacity to develop public transport and integrate land use and transport planning more generally. Technical assistance of this sort is more valuable in the long run than overseas development assistance to support investment projects, such as metro systems, linked to exports of technology.