

FORUM 2009 • 26-29 May • Leipzig

## TRANSPORT FOR A GLOBAL ECONOMY

*Challenges and Opportunities  
in the Downturn*



International  
Transport  
Forum

### WORKSHOP 5 CONCLUSIONS

## *Environmental Impacts of International Transport*

*Wednesday 27<sup>th</sup> May 2009*

#### Background:

Globalisation has accelerated economic growth and that growth has been accompanied by large increases in emissions of air pollutants, greenhouse gases and other environmental impacts. The wealth created by growth makes it possible to reduce these impacts considerably and tools to achieve this through cleaner technologies and better management of resources are available. Their deployment is largely a political decision but the instruments chosen to implement environmental protection policies should be designed to maximise welfare, reducing pollution as cost-effectively as possible closer to optimal levels.

Globalisation has changed patterns of transport. The distances goods and passengers travel have increased overall. Falling transport costs have increased the tendency for economic activity to concentrate in large cities and globalisation has thus tended to concentrate environmental impacts on the access roads to major cities and their port and airport gateways. Air pollution and noise nuisance are critical issues in the development of many of these gateways.

The workshop examined GHG emission reduction potentials for aviation and maritime transport and explored how best these potentials might be met. The 2008 International Transport Forum examined policies to mitigate CO<sub>2</sub> emissions from surface transport. Globalisation has also been accompanied by conspicuous increases in GHG emissions from both aviation and maritime transport. Addressing emissions from these sectors will be prominent at the Conference of the Parties to the UN Framework Convention on Climate Change in Copenhagen in December 2009, where negotiations to renew or replace the Kyoto Protocol will take place. The workshop assessed the options for effective policies.

## Workshop Panel:

These short conclusions were drafted by the Secretariat of the International Transport Forum in consultation with the Moderator. The Secretariat is very grateful for the rich input to the discussions from the panel of speakers listed below but takes full responsibility for the views expressed here.

- Moderator: Tony Venables, Oxford University. Centre for Analysis of Resource Rich Economies, UK
- Harald Diaz-Bone, UNFCCC
- Jos Dings, European Federation for Transport and Environment
- Christian Dumas, Airbus Industries
- Per Magne Einang, Marintek -SINTEF
- Jasper Faber, CE Delft, Netherlands
- Yoshitsu Hayashi, Nagoya University, Japan
- Raphael von Heereman, Hapag-Lloyd Flug GmbH
- Per Kågeson, Nature Associates, Sweden (report)
- Andy Kershaw, British Airways and Aviation Global Deal, UK
- Callum Thomas, Manchester University, UK

## Conclusions:

### *International Aviation and Maritime transport are fundamental to the global economy*

Aviation and maritime transport have made the globalised economy possible and continue to contribute significantly to improved welfare in both developed and developing countries.

### *They also emit significant quantities of CO<sub>2</sub> and other greenhouse gases*

Aviation emits 2.6% of world CO<sub>2</sub> emissions from fossil fuels - 1.4% from international aviation. Maritime transport accounts for 3% of world CO<sub>2</sub> emissions from fossil fuels. Until the current recession, CO<sub>2</sub> emissions from both sectors had been growing significantly - 2.8% per year for international aviation and 3.1% per year for international shipping. Both sectors also emit other shorter-term climate-forcing compounds such as NO<sub>x</sub> and black carbon that impact their overall climate balance.

*Both sectors have achieved considerable improvements in energy efficiency and have passed on benefits to consumers leading to reduced real transport costs.*

Aviation and shipping have a natural imperative to reduce fuel burn per unit of work. Aviation may be more acutely exposed than shipping due to the energy requirements associated with carrying fuel aloft. Both sectors have achieved considerable energy efficiency improvements though fuel cost is only one factor that vessel and aircraft operators consider when making purchase decisions. Other commercial or operational considerations can mask the fuel price signal, especially when fuel prices are relatively low or freight and passenger revenues high.

*CO<sub>2</sub> emission trends in both sectors are out of phase with CO<sub>2</sub> reduction policies agreed internationally.*

Limiting global warming to 2 degrees Celsius (450 ppm CO<sub>2</sub>) by the end of the century implies steeply declining emission trajectories for developed economies. It is unlikely that the targets associated with these trajectories (e.g. ~80% reduction by 2050) can be met without the strong implication of the aviation and maritime sectors.

*There is a clear technical potential to further reduce CO<sub>2</sub> emissions from air and maritime transport.*

Fuel consumption improvements of 15-20% per aircraft generation can be expected and are a commercial necessity in the current market - though aircraft product cycles can span two decades. Similarly new vessel fuel efficiency improvements can be on the order of 10-50%, but average vessel life is close to three decades and so it will take time for these improvements to cycle through the fleet. Bigger gains might be available if fuel efficiency standards could be designed to provide certainty needed for manufacturers to invest in more innovative technologies. CO<sub>2</sub> reduction stemming from retrofits and operational measures (e.g. speed reduction) are essential to achieving short to medium term emission reductions. Alternative fuels such as LNG for shipping and biofuels for aviation could represent important potential lower-carbon fuel sources for vessels and aircraft should sufficient volumes of fuels that meet low carbon and environmental standards become available.

*Emissions trading can in principal deliver emission reductions cost-effectively.*

There was a consensus in the workshop that some form of global market mechanism will be necessary in order for aviation and shipping to reduce or offset their CO<sub>2</sub> emissions. Both fuel levies and trading are being considered in international fora. The advantage of the former is that the price of carbon reduction may be known in advance though it is unclear whether politically

acceptable levies can be strong enough to trigger significant emission reductions. Trading systems can deliver strong emission reductions if the cap is ambitious but may not lead to emission reductions solely within aviation and maritime transport if the system is open. The design and architecture of the trading system matter critically if real emission cuts are to be delivered without distorting competition or leading to welfare losses in developed and emerging economies:

- Open or closed systems. Open trading systems allow for least-cost measures to be exploited across the entire economy and minimise welfare losses. However, experience within the European Trading System has shown trading systems are only as strong as their weakest link - protection of the latter in order to avoid carbon leakage erodes the effectiveness of the system. Partially ring-fenced trading may be one approach to address this, though in principle this should only be a transitory measure.
- Auctioning or allocation. Free allocation of permits generates windfall profits and more importantly distorts competition in favour of incumbent operators. Auctioning permits avoids these problems to a large extent. In aviation and shipping markets there is no rationale for free distribution of permits as all operators calling at ports covered by the trading system would be equally subject to trading.
- Global versus regional trading. International aviation and maritime transport should ideally be treated on a consistent basis throughout the world irrespective of nationality or flag. Emission trading would increase trading costs in cases when the cost of permits were passed through to shippers or passengers - in this case, the impact would be greater in relation to incomes in poorer countries. There are ways to address this. For example, the Air Global Deal proposes a global system with differentiated participation rules according to trip origin and destination. In aviation, regional approaches have already been agreed (e.g. aviation included in the European Trading System from 2012). Exit strategies should be made explicit for regional approaches and periodic re-assessment of exemptions made the rule in order not to lock-in distortions. Incentives for non-participating countries to join trading systems could be provided by, for example, making new poor and emerging economy entrants eligible for adaptation and mitigation funds generated by trading.
- Use of trading revenues. The use of auctioning and trading revenue has a fundamental impact on the acceptability of the scheme. Getting finance ministries to agree to hypothecated funds will be challenging but may be facilitated if allocation of these revenues to an international adaptation and mitigation fund is agreed by the UNFCCC.