

BRIEFING Controlling the environmental impact of the transport sector in the European Union

Cap and Share has the huge advantage that it can be implemented incrementally. For instance, it can be introduced by a single country to cover the emissions from a single sector, such as transport, and then gradually extended to other sectors and other countries. This paper explores how all forms of transport, as they compete with each other, could be treated together under a Cap and Share scheme.

The present EU emissions trading system (ETS) only covers around 45% of the EU's total carbon dioxide emissions. It omits transport, the most rapidly growing emissions source. Between 1990 and 2004, transport emissions increased by 32.2%, or 2 per cent per year on average. They now make up 24% of the EU total. Emissions from aviation rose most, by 86% during the period but, in 2004, they still only contributed 3% to the EU's total carbon dioxide emissions.¹

According to European Environment Agency figures,² transport emissions in the EU-15 increased by 14 million tonnes (1.7%) between 2003 and 2004 alone. Most of this increase was due to road freight. CO₂ from diesel oil consumption rose by 23 million tonnes, up 5 %, but this was partly offset by a decrease in CO₂ from petrol consumption which fell by 10 million tonnes, or 3 %. Although aircraft emissions increased by 7.5% in the same year, the actual emissions tonnage involved, just less than 10 million tonnes, was much lower than that from trucks.

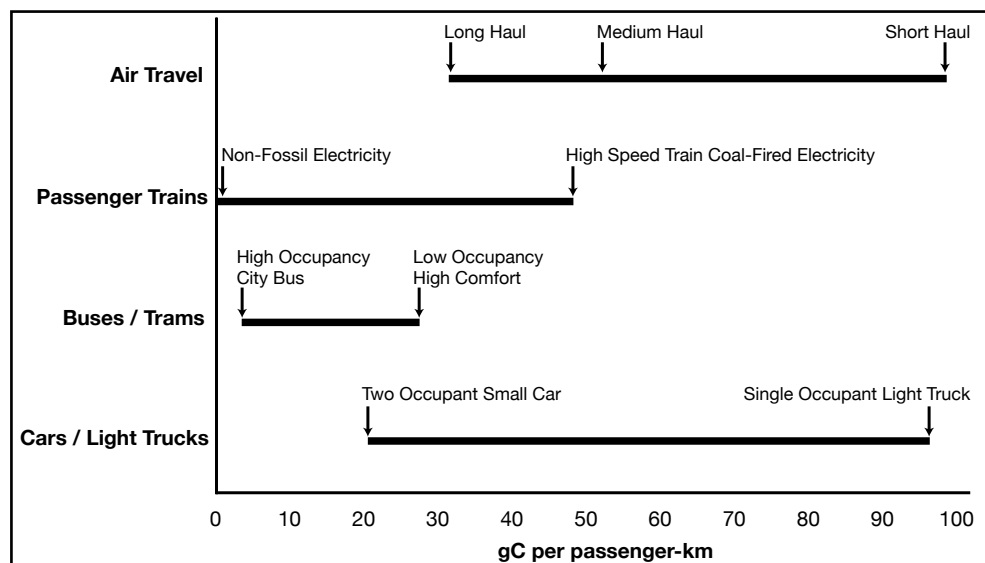


Figure 1: There are wide variations in the level of emissions from each of the various modes of transport. A small car with all seats occupied can release less emissions than a half-empty bus, while a big car or a van with only one occupant can be worse than a long haul flight per kilometre travelled. It therefore makes no sense to discriminate against one mode of travel. The same rules should apply to them all.

Source ATAG May 2006 <http://atag.org/files/PR%20LON-170002A.pdf>

This leads to the inescapable conclusion that all Europe's transport emissions badly need to be brought under control, not just those from aircraft. The European Commission plans to set up a limitation and trading system for aircraft emissions by 2010 but this would be a missed opportunity since it would leave out cars and road freight. Moreover, as Figure 1 shows, someone driving alone in a big car can cause the same weight of greenhouse gas to be released per mile as someone on a long-haul flight.

Comparing the total environmental impact of various methods of transport is more difficult than comparing their greenhouse emissions. According to a 2000 report using 1995 data from the Swiss consultancy INFRAS, the damage is 8.7 eurocents per passenger kilometre by car and 4.5 eurocents by plane. However, more recent work has indicated that the environmental damage being done by flying could be worse than car travel. For example, a 2003 study, *To Shift or not to Shift* by CE Delft concluded that aviation performs three to ten times worse in terms of climate impact than cars on competing distances, and some two to ten times worse than high-speed trains. Aircraft have a very much greater climate effect than from just their CO₂ emissions if they fly high enough to produce a contrail.³

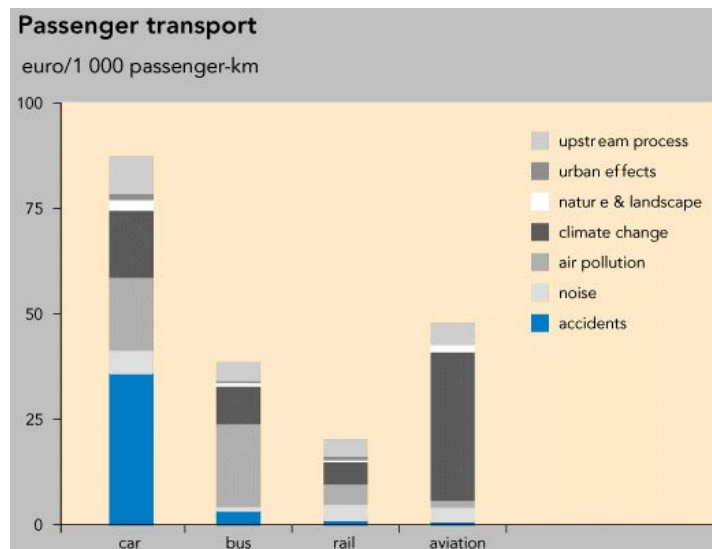


Figure 2: Average external costs of transport in 1995 by transport mode and cost category (excluding congestion costs and uncovered parking costs). Source: INFRAS/IWW, 200

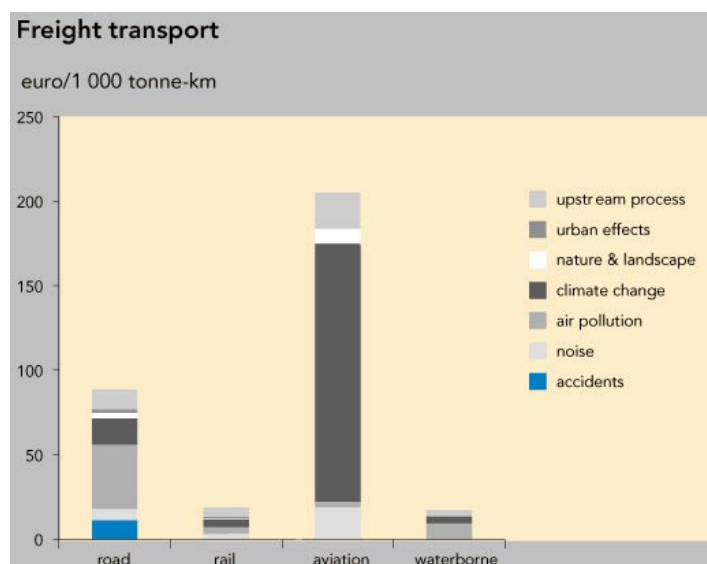


Figure 3: Average external costs of transport in 1995 by transport mode and cost category (excluding congestion costs and uncovered parking costs). Travelling by car can impose higher total environmental costs than making the same journey by plane. Source INFRAS/IWW, 2000

The same difficulties arise with freight transport. A light van can emit 1.6 Kg of carbon dioxide to move a tonne a kilometre while a fully-loaded 40 tonne heavy goods vehicle can move the same weight the same distance for only a tenth of the emissions. And sending a tonne of freight by sea in a big container vessel causes less than a hundredth of the CO₂ emissions from the van. Even sending the tonne by air can cause less emissions than the van but the overall impact of the air journey would be worse if the full effects of the flight are taken into account.

These different modes of transport are in competition with each other, so it is obviously wrong to single out aviation for restrictions based on its emissions alone. What is needed is a system that limits the total environmental cost of the EU's transport system and issues permits for that damage, so that transport's total environmental impact, not just its climate one, can be controlled and reduced.

The external costs of transport in the EU amount to around 8 % of GDP⁴ - some €800 billion or €1,750 per person. Motorised road transport – which takes the highest share in both freight and passenger trips – accounts for more than 90 % of these costs. Accidents, noise, air pollution and climate change are the most important external costs. Passenger transport is estimated to be responsible for 65 % of total external costs. The average external costs (per passenger-km) of cars are the highest, then aircraft, bus and train. For freight, water and rail transport have the lowest external costs per tonne-km, with air transport and trucking 10 and 5 times, respectively, more than rail.

How would an overall environmental impact permit system work?

European transport emissions currently amount to about 1,200 million tonnes per year. To this would be added extra “tonnage” to allow for the environmental effects of the various methods of transport apart from those on carbon dioxide levels. Suppose this had the effect of doubling the overall environmental impact, this would mean that there were 2,400 million tonnes of emissions-equivalents to distribute. Some 322 million people are aged 18 and over out of the total EU population of 456 million. Each of these adults would therefore receive a printed certificate entitling them to release just under 8 tonnes of emissions-equivalents in the first year of the system's operation. In subsequent years, the entitlement would almost certainly be reduced.

When people got their entitlements, they would take them to a bank or post office and sell them for whatever they were worth that day, just as if they were foreign exchange. The banks would then sell them on to companies importing or producing fossil-based transport fuels in the EU, who would need to get enough to cover the emissions that their products would release when used. The number of emissions equivalents (EEs) needed to sell a litre of diesel fuel would probably be higher than the number required for petrol because of the greater damage diesel fumes do. Similarly, the number of EEs needed for aviation would be based on the current best estimates of the overall damage being done by the sector.

It is impossible to say how much EU residents would get for their entitlements. This depends on how tight a cap was placed on the amount of environmental damage being done and the rate at which that damage was being reduced. If the European economy was growing strongly, the

transport sector would be trying to expand but the cap on environmental damage would prevent it doing so and the price individuals got for their entitlements would be quite high. On the other hand, the cost of air tickets, bus fares and gallons of petrol would be higher too. But anyone who used less transport than the EU average would come out better off.

A recent Scottish survey⁵ shows that the poor would benefit significantly. A random selection of fifty well off and fifty deprived people living in Edinburgh were interviewed for the study. The well-off residents had annual household incomes between £40,000 and £60,000 and, on average, caused transport-related CO₂ emissions of 6.97 tonnes a year whereas the deprived residents managed on £6,000 or less and their travel caused the release of 1.48 tonnes of CO₂. 36% of the emissions caused by the better off came from work-related travel, but only for 21% of emissions by the deprived. Holidays abroad were, in fact, the largest cause of emissions for the deprived and the second largest for the well off.

- 1 This figure refers only to the sector's CO₂ emissions, rather than to its total climate impact. If its NOX emissions, contrails and cirrus clouds are taken into consideration too, its impact is 2 to 5 times greater than that of its CO₂ alone. *Aviation Radiative Forcing in 2000*, Sausen et al., *Meteorologische Zeitschrift*, Volume 14, Number 4, August 2005, pp. 555-561-7
<http://www.ingentaconnect.com/content/schweiz/mz/2005/00000014/00000004/art00013>
- 2 <http://www.eea.europa.eu/pressroom/newsreleases/GHG2006-en>
- 3 <http://www.umweltdaten.de/publikationen/fpdf-l/2297.pdf>
- 4 http://themes.eea.europa.eu/Sectors_and_activities/transport/indicators/cost/TERM25,2001
- 5 *New Directions: Rich in CO₂* by Malamo Korbetis, David S. Reay, and John Grace, *Atmospheric Environment* 40 (2006) pp 3219–3220

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Update

Cap and Share will be one of the options discussed in a Green Paper on Sustainable Transport to be published by The Department of Transport in Ireland in late 2007. The problem C&S may be used to overcome is that CO₂ emissions from road transport in Ireland were 2.5 times greater in 2005 than they were in 1990, and are continuing to grow rapidly. If the 1990-2005 increase had not taken place, Ireland would have no problem in meeting its commitment to its EU partners under the Kyoto Protocol to limit its emissions growth to a 13% rise above 1990 levels. As things are, the rise in its emissions will be about twice that amount. One reason for the huge increase in Irish transport emissions is that the cost in terms of people's earnings of driving a car for a kilometre has fallen to about half the level it was in the 1970s and 80s.

Increasing the tax on motor fuels by enough to start a downward emissions trend would be political suicide but C&S could do the same job in a politically-acceptable way. It would work like this. The tonnage of CO₂ emissions from the petrol and diesel fuel used in Ireland in the initial year would be calculated and divided by the number of people on the electoral register. Each person would then be sent a certificate conveying his or her share of the emissions tonnage, which they would sell to a bank or post office. The tonnage purchased would be consolidated and sold on to companies importing or refining motor fuels in Ireland. Customs and Excise would verify that each firm had bought enough emissions rights when it collected the duty on the fuel. Very little extra work would be involved.