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Fuel economy not the only influence on fuel consumption

Vehicle fuel economy has markedly improved, but there are other factors that influence fuel consumption and transport emissions, according to new research on the EU, USA and Japan. Changes in vehicle size and power also play a role indicating that, if fuel prices do not keep rising, policy focus may need to shift to managing vehicle use.

To gain a better understanding of automobile energy use, the research focused on both fuel use and subsequent CO_2 emissions. It also filled gaps in previous reporting by using actual on-road fuel economy, rather than manufacturers' test figures, and included information about new vehicle characteristics, such as size, power and fuel type. Using data from the EU, USA and Japan, it analysed current trends in automobile energy use, including light trucks used as household vehicles.

Examining trends in on-road fuel intensity, i.e. how many litres of fuel are used per 100km, there has been a steady improvement. It appears voluntary agreements to advance fuel economy of new vehicles in the EU-15 and Japan in the 1990s have had an impact. After 1995, the fuel intensity of new vehicles decreased in both Japan and the EU from about 8 litres per 100km to 6 litres per 100km in 2005. In the US, the average fuel intensity of new vehicles has declined since 1970 then fluctuated around the 9 litres per 100 km mark since 1980. Recent years have seen a further important change with the EU strengthening its voluntary agreement to a mandatory target for new vehicles to produce emissions of less than 130g of CO_2 per km. Japan has also made its targets mandatory.
Comparing on-road economy data to manufacturer tests indicates a need for an adjustment of about 19.5 to 33 per cent to translate test values to actual on-the-road values. This is due to increased speeds, congestion and accessory use in real world driving compared to manufacturer tests. It could potentially mean that vehicles that reach the EU's emission target according to manufacturer tests are in fact closer to 155g of CO_2 per km on the road.

Further analysis of new vehicles suggests that greater energy efficiency appears to have fed increases in power and weight. The exception is Japan, where smaller cars are popular. In the US, up until 2003, this offset the impact of improved efficiency, where as in the EU, improvements have not been completely counteracted, but have been reduced. However, since 2006, data indicate that efficiency may now save fuel faster than power and weight can absorb it.

Increases in power and weight have been greatest for diesel cars, which may account for why the shift to diesel has not had the expected positive environmental impact. Diesels are more efficient than their petrol counterparts, but this advantage is reduced with greater increases in power and weight in diesel cars. Diesels are also driven further distances, for example, more taxis and business vehicles tend to be diesels, as well as family cars.
The study also suggests that vehicle usage as measured by vehicle kilometres per capita has been stagnant or falling in most countries. This could be the result of factors including increased congestion and an ageing population, but is also likely to depend on fuel prices, particularly in the US where taxes do not mask global oil price changes as much as in the EU and Japan. If current fuel prices remain high, this could (combined with better fuel economy) lead to new patterns of car ownership, use and fuel economy. However, if fuel prices stay the same or decline, fuel use will increase and greater policy measures may be needed to address car usage directly, such as congestion zones, pay-as-you-drive insurance and a shift from taxes on fuel to taxes on distance travelled by car.

Source: Schipper, L. (2011) Automobile use, fuel economy and CO_2 emissions in industrialized countries: Encouraging trends through 2008? *Transport Policy.* 18:358-372.

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