

Road Transport and the EU Emissions Trading Scheme

Introduction

1. The purpose of this discussion paper is to set out some details about inclusion of road transport in the EU Emissions Trading Scheme (EU ETS) and how it might work. It does not make recommendations on a preferred option or represent a UK Government position.
2. The UK Climate Change Programme, published in 2006, set out the Government's intention to build up the evidence base and consider the feasibility of developing emissions trading systems for surface transport. The 2006 Energy Review Report committed the Government to engaging with key organisations, the European Commission and other EU member states to ensure that the potential for future inclusion of emissions from surface transport in the EU ETS is given serious consideration.
3. This paper focuses on road transport rather than other forms of surface transport, because road transport emissions form the majority of surface transport emissions, although the Government is also willing to explore options for the inclusion of other sectors too. The paper explores options for how road transport could be included in the EU ETS, provides an indication of how they might work in practice and sets out some of the pros and cons of including each option in the EU ETS.
4. The European Commission has looked at the possible inclusion of road transport in their EU ETS review, but has focused on two options - inclusion of car manufacturers and inclusion of individual motorists. Details of a third option - including fuel producers in the EU ETS on the basis of their fuel sales - is also set out in this paper. However, no decisions have been taken and the UK does not at this stage have a view on the most appropriate approach if surface transport were to be included in the EU ETS.
5. The paper proposes a number of issues for further investigation. The UK intends to develop analysis of these issues and in due course to develop policy options, which will feed into the development of the UK's position on the European Commission's review of the EU ETS. Stakeholder views on the inclusion of surface transport (as well as other sectors) in the EU ETS are also currently being sought through the EU ETS Review Issues Paper and questionnaire published by Defra¹. The Government intends to publish a formal consultation later this year. The UK would be keen to share its findings in support of the UK's request to the European Commission that inclusion of road transport in EU ETS be given serious consideration as part of the current EU ETS review.

Tackling road transport CO₂ emissions

6. Road transport emissions made up roughly 20% of total greenhouse gas emissions across the EU-15 in 2004, and are expected to rise over the next few

¹ <http://www.defra.gov.uk/environment/climatechange/trading/eu/pdf/euets-issues-paper.pdf>

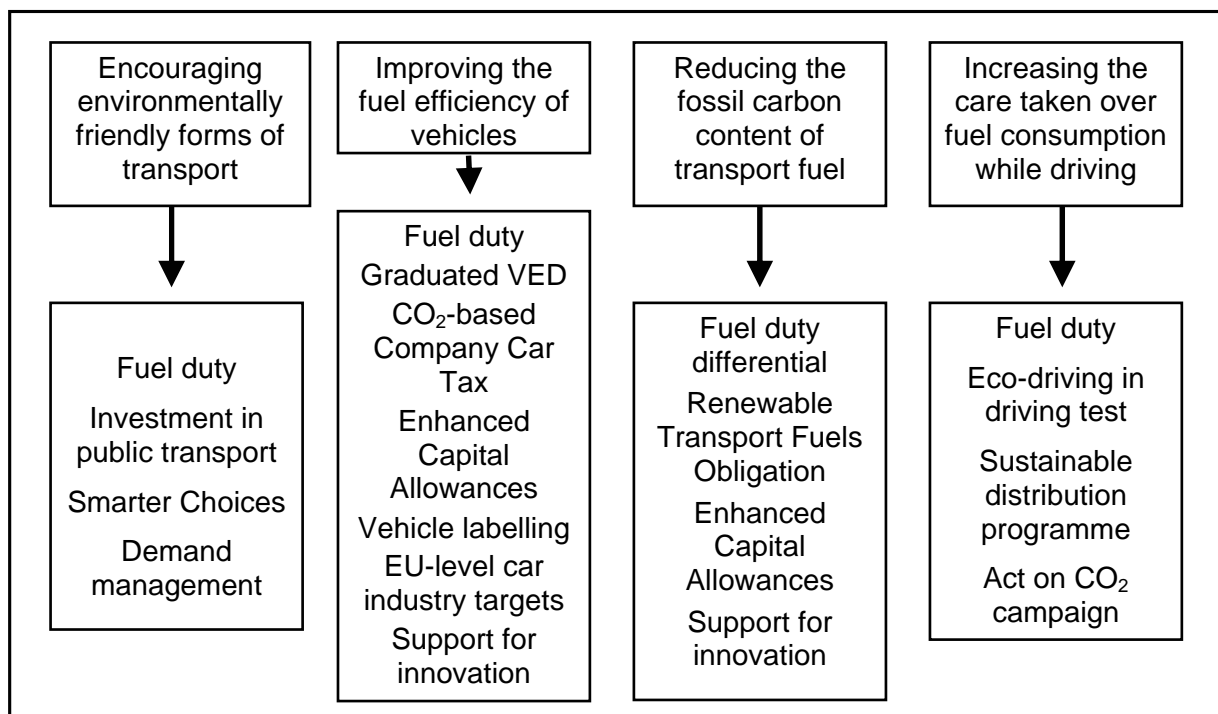
years. Eurostat estimate that EU15 transport greenhouse gas emissions in 2010 will be 27% above 1990 levels.² In the UK, emissions from transport are expected to peak around 2015 and then fall, due to expected improvements in fuel efficiency, increased use of biofuels and reduced growth in the demand for transport. However, they are expected to rise as a proportion of total emissions. Tackling CO₂ emissions from transport will therefore be an increasingly important part of a strategy to avoid climate change.

7. The Government fully recognises the need to tackle the problem of CO₂ emissions, and is taking action to:
 - encourage more environmentally friendly means of transport;
 - improve the fuel efficiency of vehicles;
 - reduce the fossil carbon content of transport fuel; and
 - increase the care that people take over fuel consumption while driving;
 - using emissions trading where appropriate.

8. The Government has put in place a combination of different instruments which target different aspects of behaviour and which work together as a package (see Figure 1 below).

9. The Government is interested in the role that inclusion in EU ETS could play as part of that package – complementing measures that already form part of the road transport CO₂ toolkit.

Figure 1: Road transport CO₂ policy measures in the UK



² Source: European Environment Agency 'Greenhouse gas emission trends and projections in Europe 2006', Annex 3 (p. 50), using the 'with additional measures' projection.

Why consider inclusion in EU ETS?

10. The EU ETS is one of the key measures for reducing carbon dioxide emissions in the UK and EU and already covers approximately half of the UK's and EU's carbon dioxide emissions. It is a 'cap and trade' emissions trading scheme. 'Cap and trade' emissions trading schemes work by distributing allowances to businesses, with these allowances setting a limit to the quantity of pollutant they can emit. The total amount of allowances allocated is set at the level required to meet an environmental objective. Businesses that can reduce their emissions cheaply are able to cut their emissions to a level below their allocated allowances, and sell their excess allowances to businesses that face higher costs of abatement or keep them for compliance in future years.
11. **Creating a consistent carbon price can help to reduce the total cost of achieving an environmental objective**, because it allows businesses flexibility to decide how and where to reduce emissions, allowing emissions abatement to be focussed on the most cost-effective abatement options. Extension of the EU ETS is one mechanism by which a carbon price can be created. As explained in the Stern Review, trading schemes can be an effective way to equalise carbon prices across countries and sectors.
12. EU ETS is a multi-sector, multi-lateral trading scheme, in that it includes a number of industrial sectors as well as the electricity generating sector, and it covers all member states of the EU and allows the use of Joint Implementation (JI) and Clean Development Mechanism (CDM) project credits³ and has the potential to develop links to other CO₂ trading schemes overseas in the future.
13. This means that it allows trade-offs to be made between reducing emissions in heavy industry versus reducing emissions in the electricity supply sector versus investing in carbon abatement projects in developing countries. This means that it allows CO₂ abatement effort to be focussed in industries and countries with the lowest abatement costs, minimising adverse economic impacts across the EU.
14. **Emissions trading puts a price on emissions that is transparent** – the price of EU ETS allowances reflects the cost of CO₂ abatement and the level of investment required to meet CO₂ reduction goals. This price provides a signal to business to help them decide when and how to invest in CO₂ abatement. It also gets passed on in electricity prices, providing an incentive to households and businesses to reduce their use of electricity.
15. At present, member states have a range of individual and collective fiscal and regulatory policies which apply an implicit carbon price to sectors outside the EU ETS. Including road transport in the EU ETS would create an additional explicit carbon price that would change automatically as the cost of abatement changed across the entire EU ETS. Fuel duty already provides a clear signal to motorists on the cost of usage. In setting the rate of fuel duty the Government also takes into account other external costs such as congestion and local air quality.

³ JI and CDM are mechanisms established under the Kyoto protocol which allow carbon savings from investments in other countries to contribute towards Kyoto targets.

- 16. Emissions trading has the potential to provide long-term price signals,** which are more likely to incentivise investment in new technology than short term measures. The total number of allowances to be allocated, and the level of financial penalty for non-compliance can potentially be announced several years in advance (although currently they are only announced 12 months in advance for EU ETS). Even if individual business allocations are not made as far in advance, businesses will be able to make judgements about likely future allowance prices and make investment decisions accordingly (although under ETS, individual allocations are currently set at the same time as the overall allocation).
- 17. Emissions trading can deliver the desired level of emissions with greater certainty than many other forms of intervention.** The allowances set a cap on total emissions, and (as long as the market works effectively) the market price of allowances should rise to whatever level is required to keep emissions within the cap. In addition, emissions trading has the potential to raise managers' awareness of the need to reduce emissions because it requires them to consider their emissions, and consider the number of allowances they need to operate. Businesses need to formulate a compliance strategy to ensure they hold sufficient allowances to cover their emissions, as they will face stiff financial penalties and may risk damaging their reputation with consumers and investors if they do not. This means that emissions trading can have an impact on behaviour that goes beyond the incentive provided by the price of allowances.

What are the options for inclusion of road transport in EU ETS?

18. There are three main options for who to regulate:
- fuel producers;
 - car manufacturers; and
 - individual motorists and hauliers.

Fuel producers

19. Transport fuels are subject to taxation in all EU member states, so the point in the supply chain at which fuel duty is paid could provide a reliable basis for regulation. Fuel duty records could provide the basis for monitoring CO₂ emissions, as standard emission factors could be applied to calculate the CO₂ emissions from each type of fuel on which duty has been paid. Under this scenario, fuel producers would need to hold EU ETS CO₂ allowances (EUAs) to cover the total amount of CO₂ emissions resulting from the fuel they sell. Fuel duty records could provide a basis for allocating EUAs, though auctioning (which would remove the possibility of "windfall profits") would also be possible.
20. Fuel producers could respond by (a) switching to fuels that have lower CO₂ emissions⁴, or (b) buying EUAs and passing the cost on as a new 'carbon price' added to the price of fuel. Motorists and hauliers may then choose how to respond to that carbon price. Possible responses could be through driving less, taking more care over fuel consumption while driving or buying a more fuel

⁴ Procedures could be established to account for the fossil CO₂ savings made from using biofuels and hydrogen.

efficient vehicle. The price of EUAs is expected to be lower than the cost of switching fuels, so the main response in the short term would be due to the impact of the carbon price on fuel consumption.

21. This option would have relatively low costs of administration, as it could build on existing procedures for collection of fuel duty. Many of the companies that would be regulated are already subject to EU ETS as they operate oil refineries.⁵ They would be familiar with the processes required for EU ETS administration and how to trade EUAs. Administrative procedures would be based on the total volume of fuels sold in a year, making administration costs much lower than the 'motorists and hauliers' option (where individual fuel purchase transactions would need to be reconciled). The number of entities regulated would depend on at what level fuel duty is paid (how far down the fuel supply chain). In the UK, the majority of fuel sold has duty paid by oil companies rather than by fuel retailers, so that regulating 20 businesses would capture over 99% of fuel sales.
22. This option addresses a small number of entities, each responsible for a large volume of emissions. Regulation would be based on actual emissions in a given year rather than estimated future emissions, as would be the case with the vehicle manufacturers' option (see below). Fuel duty records could provide the basis for estimating current CO₂ emissions, and transport demand models such as TREMOVE⁶ could be used to produce business as usual projections.
23. It would however require a change to the EU ETS Directive, to facilitate regulation of emissions from the sale of energy products (it currently only covers emissions from installations burning fossil fuels). However, a similar change might also be required if certain other sectors were to be included.

Vehicle manufacturers

24. The CO₂ emissions of new cars sold in the EU is subject to testing as part of the procedures for Whole Vehicle Type Approval. This means that the majority of cars sold in the EU have a tailpipe emissions measurement, in g CO₂/km which provides an indicator of the relative CO₂ emissions of different cars. Data is collected on the number of new cars sold that have been produced by different manufacturers. The tailpipe g CO₂/km figure is recorded for each car sold. In the future, it is expected that CO₂ testing will be applied to a wider range of vehicles. This information could be used to provide the basis for regulation of car manufacturers. There are two ways this could be done:
 - a) to fully include vehicle manufacturers in EUETS, allocating EUAs free of charge or requiring them to purchase EUAs in an auction; and
 - b) to introduce a separate regulation setting mandatory targets for vehicle manufacturers as an average of their cars sold, which would allow them to sell CO₂ emission credits if they go further than the target, and allow them to purchase EUAs or CO₂ emission credits if they did not meet the target.

⁵ Oil refineries are currently included in EU ETS on the basis of their direct combustion emissions.

⁶ <http://www.tremove.org/>

25. Under option (a), vehicle manufacturers could be required to hold sufficient EUAs to cover the expected lifetime emissions from the vehicles they sell. The expected lifetime emissions could be calculated by multiplying the tailpipe g CO₂/km figure by a notional lifetime vehicle km driven (such as 100,000 km)⁷. Manufacturers could be required to surrender sufficient EUAs to cover vehicle lifetime CO₂ emissions, at the time of sale (in the year that the vehicle is sold). Under option (b), there would need to be a similar methodology for converting CO₂ emission credits into EUAs and vice versa.
26. Under both options (a) and (b), manufacturers could choose either to invest in fuel efficiency technology to reduce the CO₂ emissions of their vehicles, or to buy EUAs and pass the cost on as a new 'carbon price' added to the price of vehicles. The carbon price would then have an impact on consumer behaviour, with more consumers choosing to buy more fuel efficient vehicles.
27. In practice, it may be difficult to arrive at a method of allocating allowances for option (a) that is accepted as fair by all vehicle manufacturers, as it would need to be based on numbers of vehicles sold in the past or projected for the future, as well as the average CO₂ emissions of vehicles. Free allocation based on grandfathering has the potential to confer windfall gains to the recipients of EUAs and so the distribution of EUAs to vehicle manufacturers (which in many cases are viewed as an important part of a nation's industrial base) could become highly politicised. Auctioning could address this issue and would avoid the potential for "windfall profits".
28. Under both options (a) and (b) there could be a risk of undermining the integrity of EU ETS. This is because it would only be possible to regulate on the basis of estimated future emissions rather than actual emissions when the vehicle is in use. A solution could be to set up a separate regulation for vehicle manufacturers, with a 'buy-only' link to EU ETS (vehicle manufacturers could buy EUAs but they could not sell EUAs or CO₂ reduction credits in to EU ETS).
29. However, it is possible that neither option would result in improvements in car fuel efficiency. Instead, vehicle manufacturers may choose to buy EUAs, and pass the cost on to consumers. The Government believes that improving new car fuel efficiency is an essential part of a long term CO₂ reduction strategy for road transport and believes that even if this option were to happen, there would still be a strong case for some form of separate intervention on new car fuel efficiency.

Motorists and hauliers

30. This would involve allocating EUAs to private motorists and hauliers, and requiring them to surrender sufficient EUAs (to cover the emissions from the fuel they buy) when they buy road fuel. People that wanted to emit more than the EUAs that had been allocated to them would have to buy EUAs on the carbon market.

⁷ Possibly also making an adjustment for the added emissions expected in use as actual driving conditions do not match conditions in the g CO₂/km test.

31. In practice, it is likely that intermediaries such as road fuel retailers would enter the market for EUAs, providing a service to their customers to sell them sufficient EUAs to cover the fuel they buy. This means that this option would in practice be very similar to the 'fuel producers' option described above, with a new 'carbon price' being added to the price of road fuel. Motorists and hauliers would then choose how to respond to that carbon price by driving less, taking more care over fuel consumption while driving or buying a more fuel efficient vehicle.
32. This option would require the regulation of a very large number of individuals, each with relatively small volumes of emissions (in some cases, less than a single EUA, which covers the emission of one tonne of CO₂ – current EU ETS rules only allow trading of whole allowances). It would therefore be likely to involve high costs of administration and high transaction costs. It also might be difficult to arrive at an allocation methodology that is widely accepted as fair.
33. This option would not fit well with the current EU ETS set-up which is aimed at large-scale polluters, and so, as with the fuel producers option, would require a change to the terms of the EU ETS directive (which currently focuses on stationary installations).

Issues to consider

34. The European Commission has, in its review of the EU ETS, so far focussed on the individual driver and car manufacturer options. This paper suggests that the fuel producers option also merits consideration. The following two sections consider further work that could be carried out on this option to develop thinking in this area and to inform and add to the Commission's review of the EU ETS.
35. The impacts of including fuel producers in the EU ETS are still uncertain and require further investigation. One of the main impacts of interest is the impact on EUA prices and hence the cost of compliance to sectors already regulated under EU ETS. The EUA price impact would depend on (a) the level of under allocation to road transport; (b) the cost of abating CO₂ emissions in transport relative to sectors already regulated in EU ETS; and (c) the price and availability of CDM credits. If fuel producers were included in EU ETS, the level of under-allocation could to some extent be chosen taking into account expected impacts on EUA prices.
36. Another area that needs careful investigation is the impact on road fuel prices. This could effect the cost of transporting goods, demand for road fuel and consequently fuel duty revenues.
37. The main issues for further investigation are:
 - practical feasibility, administrative and transaction costs;
 - potential impacts on EUA prices, electricity and fuel prices and the consequential impacts on business and international competitiveness;
 - expected outcome in terms of how and where the emissions reductions are achieved;

- interaction with other policy instruments addressing transport CO₂ emissions;
- what would be the impact of fully integrating road transport into EU ETS versus making it subject to a separate scheme with a link to EU ETS (to limit the extent to which transport can buy EUAs from other sectors);
- what would be the impact of different allocation methodologies;
- what would be the impact of different levels of allocation;
- what would be the feasibility and impact of setting an EU-level cap for road transport, versus including road transport in national caps with member states determining the amount of EUAs allocated to road transport;.
- the impact on the motorist and on the haulage sector; and
- the impact on public finances.

38. Investigation of these issues, based on the cost and expected availability of CO₂ abatement measures for phase III of EUETS will allow an assessment of whether or not including road transport in EU ETS is a viable and attractive option.

Interaction with other policy instruments

39. In the short term to medium term, the effect of including road transport in emissions trading is likely to be that the transport sector buys EUAs from other sectors and uses Joint Implementation (JI) or Clean Development Mechanism (CDM) credits from investment projects in developing countries. This is because the cost of CO₂ abatement in road transport is expected to be higher than in other sectors. So it would be more cost-effective to abate CO₂ emissions in other sectors than to try to achieve the same levels of emissions abatement in transport. Inclusion of road transport in EU ETS would initially mean that a proportion of transport CO₂ emissions are offset by reductions in other sectors or in developing countries.

40. In the long term, the carbon price in EU ETS may be sufficient to support the use of renewable energy in road transport and support investment in fuel efficiency technology. This is because in the long term, the carbon price in EU ETS may be higher than today if tighter caps are set reflecting long term goals to reduce CO₂ emissions (although the cost of technologies to reduce emissions may come down over time). The cost of CO₂ abatement in the transport sector may also come down as oil prices rise and production efficiencies are achieved in renewable energy and energy efficiency technology for fuels and vehicles.

41. Inclusion of road transport in EU ETS could therefore sit alongside other forms of direct intervention such as fuel duty, RTFO, successor to the EU-wide new car CO₂ voluntary agreement, etc. It would provide a way for a proportion of transport emissions to be offset by reductions in other sectors, complementing efforts to reduce emissions within the transport sector. In the long term the EU ETS carbon price could play a stronger role determining the appropriate level of carbon abatement in the transport sector relative to other sectors

42. For example, the Renewable Transport Fuels Obligation (RTFO) will set targets for minimum levels of biofuel use in road fuels in the UK. Those targets would continue to determine the level of biofuel use after the inclusion of road transport

in EU ETS. However in the long term, including fuel producers in EU ETS could incentivise use of renewable fuels beyond the RTFO targets – as long as this is environmentally sustainable and cost effective relative to CO₂ abatement options in other sectors.

43. The Commission has announced its intention to bring forward a regulatory proposal which would set mandatory targets for new car fuel efficiency. The focus for those targets is initially 2012, but longer term targets may follow. Including fuel producers in EU ETS could sit alongside the fuel efficiency targets, providing manufacturers/consumers with an increased incentive to produce/purchase more fuel efficient vehicles because of the carbon price that would potentially be added to road fuel prices. It would also help to ensure that the CO₂ savings from improvements in fuel efficiency are not undermined by a 'rebound effect' whereby people drive more because their fuel cost/km are lower.
44. Whatever succeeds the current voluntary agreements will only cover cars and possibly small vans. It will not cover all vehicles and it will not provide incentives to reduce fuel consumption in other ways (switching to more environmentally friendly modes of transport and taking care over fuel consumption while driving). Inclusion of road transport in EU ETS would therefore have broader CO₂ saving impacts than new car fuel efficiency targets.

Summary

45. The European Commission have so far focused on two options for including road transport in the EU ETS - inclusion of individual drivers and inclusion of car manufacturers. Details of a third option - including fuel producers in the EU ETS on the basis of their fuel sales - is also set out in this paper, along with information on how all the options might work and what further issues need addressing.
46. The impacts of including fuel producers in EU ETS are highly uncertain and require further investigation. One of the main impacts of interest is the impact on EUA prices and hence the cost of compliance to sectors already regulated under EU ETS. The EUA price impact will depend on (a) the level of under allocation to road transport; (b) the cost of abating CO₂ emissions in transport relative to sectors already regulated in EU ETS; and (c) the price and availability of CDM credits. If fuel producers were included in EU ETS, the level of under-allocation could to some extent be chosen taking into account expected impacts on EUA prices.
47. Including fuel producers in EU ETS would bring transport into the mainstream EU-level mechanism for tackling CO₂ emissions, providing a mechanism for:
 - making trade-offs between reducing emissions in the transport sector versus reducing emissions in heavy industry or the electricity supply sector or investing in low-carbon technology projects in developing countries. If reducing emissions in the transport sector turns out to be more expensive than in other sectors, EU ETS would provide a way for transport to contribute to CO₂ reductions in other sectors. The emissions abatement would be achieved at lower cost than if same quantity of CO₂ emissions were abated in the transport sector;

- adding a new 'carbon price' to road fuel prices that could supplement existing policy measures in a way that is transparently linked to climate change policy, providing an enhanced incentive to motorists and hauliers to change their driving choices, buy more fuel efficient vehicles and take more care over fuel consumption while driving;
- providing long-term price signals to fuel producers and vehicle manufacturers to invest in energy efficient, low-carbon technology that would augment direct intervention measures designed to have an impact in the short to medium term;
- EU-level action to address CO₂ from transport, with the same carbon price impacting on transport costs across the EU. This would help to avoid adverse competitiveness impacts that could otherwise occur if individual countries take unilateral action;
- delivering CO₂ savings with certainty.

48. EU ETS would provide a way for a proportion of transport emissions to be offset by reductions in other sectors, complementing efforts to reduce emissions within the transport sector. In the long term the EU ETS carbon price could play a stronger role determining the appropriate level of carbon abatement in the transport sector relative to other sectors.

49. Inclusion of road transport in EU ETS could sit alongside other forms of direct intervention to reduce road transport CO₂ emissions such as policy instruments targeted at the use of biofuels, fuel efficiency, eco-driving, etc. The interaction with these other instruments would need to be carefully considered. Member States would also need to be mindful of the potential impacts on public finances.

50. The earliest that road transport could be included in EU ETS is 2013. If road transport were to be included, it could be several years before EU ETS has an impact on investment decisions and behavioural change. The Government therefore believes that it is important to consider inclusion of road transport in EU ETS at the earliest opportunity, whilst maintaining efforts to introduce direct forms of intervention, such as the Renewable Transport Fuels Obligation and creating a successor to the EU-wide voluntary agreements on car fuel efficiency.