

# Transport

## Transport in the wider context

6.1 Transport dominates the UK's use of oil with 74% of supply used to power the cars, planes, buses, trains and lorries that we depend upon. This produces 42 million tonnes of carbon (MtC) per annum or around a quarter of all current UK carbon emissions. Good transport services are essential for a successful economy and society. They provide access to jobs, services and schools, deliver goods to shops, and allow us to enjoy our free time.

6.2 Although emissions from this sector have increased since 1990, growth in emissions is slowing down, and is not expected to grow as strongly in the future. Emissions from transport are projected to reach a peak around 2015 and thereafter fall. This is on the basis of projections that growth in demand for transport moderates, fuel efficiency in transport continues to improve and lower-carbon fuels, especially biofuels, increase their market share.

6.3 Current government policies tackle transport emissions using a full range of policy levers. Since 1997, the Government has introduced a range of economic instruments to incentivise take-up of lower-carbon transport fuels and vehicles, including the Renewable Transport Fuel Obligation, reforms to Company Car Tax and Vehicle Excise Duty. These are supported by EU voluntary agreements on new car fuel efficiency, measures encouraging people to make more sustainable travel choices and record investment into public transport to give people a viable alternative to travelling by car.

6.4 Analysis for the recent Climate Change Programme Review showed that existing Government policies in transport would save similar amounts of carbon in 2010 (proportional to sector emissions) as in other sectors and that had we not acted emissions from transport would have been 15% higher in 2010.

6.5 Nonetheless, the Government recognises the scale of the environmental challenge for transport and the urgent need for robust action to tackle the problem of rising carbon emissions. We are committed to taking action in the near term whilst also looking to the future and our long-term goals. That is why we have already put in place a range of policies which taken together will have a significant impact on transport emissions. We are working in four ways to tackle the emissions from transport in both the near and the long term by:

- reducing the carbon content of transport fuel;
- reducing the carbon emissions of vehicles;
- encouraging moves toward more environmentally-friendly transport; and
- working in Europe to include aviation in emissions trading, and to consider including surface transport.

6.6 In the near-term, measures to reduce emissions from transport are often difficult and expensive to implement. Securing a change in people's transport behaviour and their choice of transport is also not straightforward. In the longer term we expect the emergence of new technologies including hybrids,



advanced biofuels and hydrogen to play a major part in reducing transport emissions post 2020. New vehicle technologies take a long time to feed through to market and become more widespread.

6.7 This report summarises a range of policies which are aimed at delivering carbon reductions in the near-term. It also focusses on putting in place the incentives and framework necessary to pull through the longer term technological developments to reach our ambitious 2050 carbon target.

6.8 The policies presented below reflect the fact that without policy intervention the cars that we currently buy and the way we currently travel will not get us to where we need to be in emissions terms, due to market failures. These include failure of information reaching consumers to allow them to make informed decisions and market failures that inhibit innovation (e.g. high risk premiums, uncertain carbon markets and technology lock-in).

6.9 These policies consider cost-effectiveness as well as the importance of supporting the development of a broad range of different technologies. They also recognise the importance of undertaking the challenging but vital work of securing the agreement of other countries to spread the positive impact of such policies beyond what could be achieved in the UK alone.

## Reducing the carbon content of transport fuel

### **The level of the Renewable Transport Fuel Obligation will be increased provided important conditions are met.**

6.10 In November 2005, the Government announced it would introduce a Renewable Transport Fuel Obligation (RTFO). This requires transport fuel suppliers to ensure a proportion of their sales are from renewable sources. The RTFO will be introduced in 2008/9 with the obligation level rising to 5% by 2010/11. We estimate that this policy alone will save one million tonnes of carbon in 2010, the equivalent to taking one million cars from our nation's roads.

6.11 The Government now intends the level of the Obligation to rise above 5% after 2010/2011 provided three critical factors are met:

- development of robust sustainability and carbon standards for biofuels to ensure that they are delivering high levels of carbon savings without leading to biodiversity loss or endangering sensitive habitats;
- development of new fuel quality standards at EU level to ensure existing and new vehicles can run on biofuel blends higher than 5%; and
- costs to consumers being acceptable.

6.12 If these criteria are met, and for example we were able to raise the level of the obligation to 10% by 2015, we would save up to a further million tonnes of carbon a year, equivalent to removing yet another one million cars from our roads. The Government will be consulting stakeholders on such future enhancements to the RTFO as part of its consultation on the RTFO Regulations in early 2007.

## Reducing the carbon emissions of vehicles

6.13 In addition to improving the carbon content of our fuels we are also looking to improve the fuel efficiency of vehicle engines. Our work with manufacturers and our European partners has secured real progress in recent years. The Voluntary Agreements on new car fuel efficiency between the European Commission and the automotive industry have seen new car carbon emissions fall by 12% across the EU since 1995.

6.14 The current Voluntary Agreements on new car fuel efficiency between the European Commission and the automotive industry are due to expire in 2008/2009. These aim to reduce new car average CO<sub>2</sub> emissions to 140g/km; an improvement of 25% compared to 1995.

6.15 The Government believes that while improvements have been made, the full potential of an EU-wide scheme has not yet been fully realised. The UK will therefore continue to work with the European Commission and relevant stakeholders in developing successor arrangements to the current Voluntary Agreements on new car fuel efficiency.

6.16 While any decision on successor arrangements will be subject to consultation with the vehicles industry and other stakeholders, the UK will maintain our stance that all options, including mandatory targets with trading, must be considered.

6.17 Despite the work outlined above to increase the efficiency of vehicles and reduce the carbon content of fuel, it is clear that over the longer-term, the development of low carbon technologies is vital to secure large cost-effective reductions in carbon emissions from the transport sector. Encouraging such developments requires further technological developments. If the right technologies are not brought from laboratory research and development all the way to commercialisation, these options will be closed off, and we will be severely restricted in our ability to reduce carbon emissions.

6.18 Technologies such as plug-in hybrids, advanced biofuels and hydrogen are now being developed internationally. Hydrogen is an "energy carrier" which can be used in a fuel cell (where it produces zero emissions at the point of use) and in normal combustion (e.g. an internal combustion engine). Studies published with this Review show that for the UK the use of hydrogen offers significant opportunities for cost-competitive CO<sub>2</sub> reductions in transport by 2030. None is readily available today but they are sufficiently promising to be worth pursuing as energy options for the UK.

6.19 In June 2005, the Government published "A Strategic Framework For Hydrogen Energy Activity in the UK", which included a funding package of £15 million over four years for a UK wide hydrogen and fuel cell demonstration programme. Currently the Government supports industrial collaborative research and development for fuel cell and hydrogen technologies through the programme.

6.20 The Government has also provided funding of over £450,000 for the trial of hydrogen-powered fuel cell buses in London as part of the EU CUTE (Clean Urban Transport in Europe) project. £6.5 million of funding has been



committed for the fuel cell and low carbon vehicle technology Centre of Excellence (CENEX) based in Loughborough. The Department for Transport announced in January, as part of their Horizons innovative research programme, a competition for projects to investigate the options for the further steps required to move to the adoption of a hydrogen transport infrastructure. This will support 2-4 projects examining the practicality and timing of the introduction of the required infrastructure to support hydrogen-fuelled vehicles.

6.21 The Government announced in 2003 a £10 million programme to encourage the development and demonstration of Low Carbon Passenger Cars. This programme was subsequently administered by the Energy Savings Trust (EST) and the first of three funded projects on hybrid technology was completed successfully in 2006.

6.22 The Government commissioned an assessment of the future potential of low carbon transport technologies, discussing the issues and difficulties surrounding each<sup>65</sup>. This work looked at all transport technologies, vehicles and fuels that have the capability to bring about large reductions in carbon emissions, principally hydrogen, advanced biofuels and hybrid technologies. It summarised the carbon abatement potential of each, the present blocks to implementation, as well as current and future costs.

6.23 We think there is scope to do more to ensure there is a consistent, Government wide framework for incentivising technology in transport. We therefore propose to develop a Low Carbon Transport Innovation Strategy to spur vital innovation in low carbon transport technologies. This will complement the recently announced National Institute of Energy Technologies. For all technologies that show promise the Innovation Strategy will:

- efficiently allocate money to laboratory research and development;
- facilitate development into working products;
- find funding for practical demonstrations in the real world; and
- allow the most cost-effective technologies to come to market.

6.24 The Innovation Strategy will be evidence-based. It will aim to leverage efficiently private sector funding, make minimal demands of public funds, and progress the use of international partnerships to improve resource sharing and knowledge transfer.

6.25 The Strategy will review current government policies that affect transport innovation and make recommendations for changes and for new policies. The Strategy will be taken forward in conjunction with the Powering Future Vehicles Strategy Review this year. By analysing the entire innovation system, a more co-ordinated approach to incentivising technology will be developed. In taking forward the Low Carbon Innovation Strategy we aim to assist not simply innovation but also the application of technologies that will significantly reduce carbon emissions in the long term.

65 E4Tech, "UK carbon reduction potential from technologies in the transport sector", May 2006.

## Encouraging moves toward more environmentally-friendly transport

6.26 The Government's record investment in transport infrastructure, to give more people real alternatives to travelling by car, reflects our commitment to reducing the carbon impact of transport by encouraging more environmentally friendly forms of transport. Britain now has the fastest growing railway in Europe – with more than a billion passenger journeys undertaken last year. People are now travelling further by rail than in any year since 1946. Since 1996-97, rail passenger kilometres have grown by 30%, and rail freight is up by 36%.

6.27 The foundation on which this growth has been achieved is unprecedented levels of government investment in the rail network to address decades of under-investment. For example, between 2004/5 and 2008/9 the Government will be spending over £23 billion on Britain's railways to make up for years of under-investment. Next year we will set out firm plans for the coming five years to meet the demands of a growing railway.

6.28 Buses too provide essential alternatives to the private car, especially where congestion – and the associated problems of air quality – are a growing problem. The Government has worked to halt the long-term decline in bus use. Local and central Government provides over £2 billion annually to provide bus services that offer a genuine alternative to the car. Rural Bus Subsidy Grant now supports over 2,200 rural bus services with over 29 million passenger journeys made on these services annually. Total journeys taken in England by bus have increased for each of the last 6 consecutive years; in the last 5 years bus use in England has grown by around 8%.

6.29 But in too many places outside London, bus use is still declining. The Department for Transport is therefore currently examining the existing arrangements for bus provision and will be working through in the coming months proposals for improving the public transport offer provided by buses outside London.

6.30 Together with these investments and innovations in public transport, the Government promotes a package of policies entitled Smarter Choices, aimed at helping people choose sustainable travel options. Smarter Choices projects include the Travelling to School initiative which aims to have active travel plans in every school in England by the end of the decade. In recent weeks the Government has also doubled Cycling England's budget to £30 million over the next three years.

6.31 The Government has embarked upon a programme to enhance consumer information on transport emissions and climate change. A key part of our strategy is to ensure individuals and manufacturers have the right information and incentives to encourage them to make the most environmentally friendly choices on transport.

6.32 The decisions of individuals on vehicle purchase and mode of transport have a significant impact on carbon emissions. We need to ensure that consumers have the right information when buying vehicles to allow them to make choices informed by the impact on climate change. With this in mind, most UK car showrooms now display colour-coded fuel efficiency labels,



developed and delivered in close cooperation with the vehicle industry and the Low Carbon Vehicle Partnership (LowCVP), which are directly linked to the Vehicle Excise Duty (VED) bands and which will be familiar to consumers used to similar labels for their household white goods. We also need to make information more readily available to travellers generally on the carbon impact of their travel choices.

6.33 Many citizens are now seeking a clearer understanding of the carbon consequences of the travel choices they make. The Government will therefore act to raise awareness of transport and climate change issues and the options available to individuals. This will be achieved by:

- improving the quality of information available to purchasers of new vehicles; and
- improving access to information for travellers on the carbon impacts of different modes of travel.

6.34 This approach will include developing initiatives to promote consumer information on buying greener vehicles, on eco-safe driving, and to assist businesses by promoting the benefits of workplace travel planning.

6.35 The Government has delivered a series of fiscal measures to incentivise consumers to use more fuel efficient vehicles. The principle that fiscal measures can play a part in achieving our environmental goals has been established. Company Car Tax was reformed in 2002 to make it carbon-based. Vehicle Excise Duty, which was flat-rate in 1997, was graduated in 2001 by carbon emissions. In Budget 2006 the banding system was reformed, reducing the duty for the lowest emission cars to zero and increasing the duty for the highest emissions cars to £215. Combined with savings expected from the Voluntary Agreement on new vehicle fuel efficiency these measures are expected to deliver reductions of 2.3m tones of carbon in 2010. Based on the principles of policy already established, we will continue to examine how fiscal and other policy instruments can achieve these aims.

## **The UK is leading in Europe to expand the EU Emissions Trading Scheme to include aviation, and to consider the case for future inclusion of surface transport.**

6.36 Emissions trading uses market forces to deliver emissions reductions in the most cost effective manner. It guarantees a specific environmental outcome in a way that other instruments do not. It allows coverage of environmental costs through a mixture of emission reductions within a particular sector and purchase of reductions in circumstances where these can be produced more cheaply by other sectors. The cost of reducing emissions in transport is currently relatively high. Therefore transport would be expected to buy credits from other sectors that can reduce emissions more cheaply in the short term. This would be expected to change over time as the price incentive helps make new technology more widespread in transport, causing abatement costs to fall relative to other sectors.

6.37 Larger trading schemes have greater scope for finding the most efficient carbon reductions. Including surface transport and aviation in the EU Emissions Trading Scheme could therefore lower the overall costs to the economy of combating climate change.

6.38 Last year under the Presidency of the United Kingdom, the European Union made real progress towards including aviation in the EU Emissions Trading Scheme (EU-ETS) from 2008 or as soon as possible thereafter. The European Commission now aims to produce a legislative proposal and impact assessment on the inclusion of aviation in the EU ETS by the end of 2006. The Government continues to explore options for the use of other economic instruments and reserves the right to act alone or bilaterally if progress towards agreements at international level proves too slow.

6.39 The European Commission is currently carrying out a review of the EU ETS. The Government will ensure that inclusion of emissions from surface transport is given serious consideration in this review. The Secretaries of State for DfT, DTI, and Defra have already jointly written to the Commission to ask them to take this step.

### **The combination of these policies, if fully delivered, would substantially reduce carbon emissions**

6.40 In the longer term, technology development can produce substantial carbon reductions from transport, but this requires action now to provide the right incentive framework. Government recognises the urgency of tackling the problem of rising carbon emissions in the transport sector. In the medium term, the policy package could deliver significant carbon savings – some of which are quantified here. A successor to the existing Voluntary Agreements and moving beyond a 5% RTFO could reduce carbon emissions from transport by around 2 – 3 MtC in 2020. Adding surface transport into the EU ETS with demanding caps (which the Government believes merits serious consideration), might save 4 – 7 MtC 2020<sup>66</sup>. More significant reductions would be likely to come after 2020 as technological development enables goods and people to be transported with lower carbon emissions.

6.41 There would be positive effects on security of supply. A successor to the Voluntary Agreements could save approximately 3 billion litres of fuel (petrol and diesel) per year by 2020. Every 1% increase in the RTFO could save around 0.5 billion litres a year, replacing these with fuels from renewable sources.

6.42 The achievement of the savings set out above would require all these proposals to be implemented fully. This requires action by individuals, business, by national governments and international organisations such as the EU. The scale of the challenge is considerable, but so too are the opportunities. The Government recognises its responsibilities to secure a modern, efficient system that gets people to work, allows businesses to

<sup>66</sup> These numbers are highly dependent on several assumptions and should be thought of as indicative of the kind of reductions that could be expected.



operate effectively, enables goods to be transported efficiently, and allows people to make the most of their leisure time. But we are clear that we need to achieve these transport goals whilst meeting our environmental obligations.

## Transport Commitments

- **Government intends the level of the Renewable Transport Fuel Obligation to rise above 5% after 2010/11 provided robust carbon saving and sustainability assurance schemes can be developed, technical vehicle and fuel standards are adequate and costs to consumers are acceptable.**
- **Government will engage 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 Emissions Trading Scheme (ETS) is given serious consideration.**
- **Government will continue to work with the European Commission and relevant stakeholders in developing successor arrangements to the current Voluntary Agreements on new car fuel efficiency when those Agreements expire in 2008/09. This must include consideration of all options, including mandatory targets with trading.**
- **Government reaffirms its support for the inclusion of aviation in the EU ETS and continues to take a leading role in its promotion. It continues to explore options for the use of other economic instruments and reserves the right to act alone or bilaterally if progress towards agreements at international level proves too slow.**
- **Government will develop a Transport Innovation Strategy in close collaboration with the ongoing energy innovation framework and the National Institute of Energy Technologies. This will comprehensively review current policies and explore others, such as second generation biofuels and hydrogen, where necessary.**
- **Government has embarked upon a programme to enhance consumer information on transport emissions and climate change. This will be informed by continuing current research into public attitudes and behaviours towards climate change and transport.**