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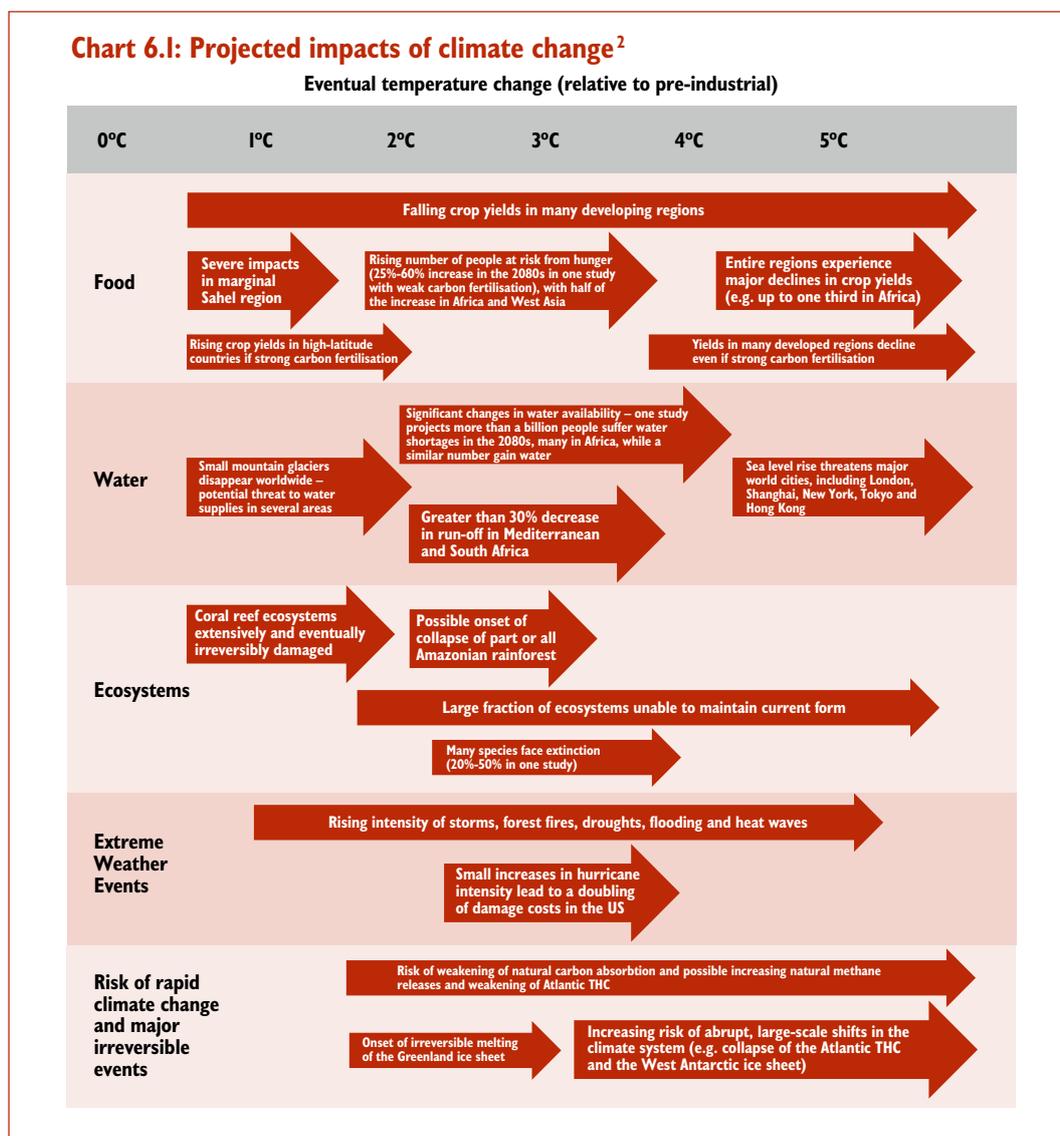
AN ENVIRONMENTALLY SUSTAINABLE WORLD

Tackling climate change is the most serious and pressing global environmental challenge the world faces. Budget 2008 sets out new policies to reduce emissions across all major sectors of the economy and ensure the UK continues to lead the climate change agenda internationally. The Government is also acting to protect the UK's natural environment. Budget 2008 announces:

- **laying the ground work for the introduction of five-year carbon budgets, and that the first budgets will be set alongside Budget 2009;**
- **reform of car vehicle excise duty rates and bandings, introducing new bands from 2009 to reward drivers of the cleanest cars, and higher first year rates in 2010-11 to influence purchasing choices. As a result of these changes the majority of drivers will be better or no worse off;**
- **the planned fuel duty increase of 2 pence per litre in April 2008 will be delayed until 1 October 2008. Main road fuel duty rates will rise by 1.84 pence per litre on 1 April 2009, and will increase by 0.5 pence per litre above inflation on 1 April 2010;**
- **auctioning 100 per cent of allowances for large electricity producers in Phase III of the EU Emissions Trading Scheme;**
- **funding for the Green Homes Service to advise consumers on how to reduce carbon emissions, waste and water consumption;**
- **strengthening the environmental incentives for taxation of business cars, along with simplifying measures;**
- **incentivising only the most sustainable biofuels, by shifting support away from the duty differential to the Renewable Transport Fuel Obligation in future years;**
- **increasing climate change levy rates in line with inflation, in order to maintain the environmental incentive effect;**
- **to strengthen the environmental signal through taxation, forecast tax revenues from the new per plane duty, due to replace air passenger duty on 1 November 2009, will increase by 10 per cent in the second full year of operation;**
- **an ambition for all new non-domestic buildings to be zero carbon from 2019 with consultation on the timeline and its feasibility and new public sector buildings from 2018;**
- **extending the Stamp Duty Land Tax exemption from zero carbon homes to new flats, retrospectively from 1 October 2007;**
- **that to eliminate single-use carrier bags, the Government will legislate and impose a charge if retailers do not take voluntary action; and**
- **increasing the aggregates levy from 1 April 2009 to maintain its environmental impact.**

6.1 Tackling climate change is the most serious and pressing global environmental challenge the world faces. Concentrations of carbon dioxide and other greenhouse gases have increased markedly as a result of human activities, and the impacts can now be readily observed in increases in the world's air and ocean temperatures, widespread melting of snow

and ice and rising sea levels.¹ Without a major global effort to reduce emissions of greenhouse gases, temperatures could rise by 5-6°C by the end of the century (see Chart 6.1). A change in the global climate on this scale would have major and irreversible consequences, including physical changes likely to lead to large-scale movements of population, serious impacts on the ability to meet basic human needs for food, water and security (particularly in the developing world), and the loss of unique and valuable habitats and species.



6.2 The Stern Review² concluded that the costs of reducing emissions to levels that avoid the worst risks of climate change are significant but manageable, whereas delay will be costly and dangerous. This conclusion has stood up to vigorous international scrutiny and debate since the report was published.

6.3 The Government has adopted the framework for climate change policy recommended by the Stern Review, based around three key elements:

- pricing carbon through trading, tax or regulation – ensuring that emissions reductions are delivered in the most cost-effective way;

¹ Technical Summary in *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K. B. Avery, M. Tignor and H. L. Miller (eds.)]. Cambridge University Press, 2007.

² *The Economics of Climate Change: The Stern Review*, Cambridge University Press, 2007.

- encouraging innovation in low-carbon technologies; and
- removing barriers to action, including policies to encourage long-term behavioural change.

6.4 The Budget sets out new policies to reduce emissions across all major sectors of the economy and ensure the UK continues to develop its international leadership of the climate change agenda.

BUILDING A GLOBAL DEAL

6.5 Climate change is an international issue that requires coordinated international action. The momentum, both for practical action and for reaching a global deal, is building in countries around the world. The UK is playing a leading role taking this forward in the EU, at the UN, through the G7 and bilaterally.

6.6 In the EU, the UK was instrumental in the agreement of ambitious EU objectives on climate change and energy. These include the development of emissions trading and carbon markets as a tool for tackling climate change cost-effectively.

Box 6.1 UK leadership on EU and international action

The European Commission has recently published its proposals including:

- **ambitious plans to develop Phase III of the EU Emissions Trading Scheme (from 2012 to 2020). Defra will consult on the implications of the Commission's proposals;**
- **a target of 20 per cent for greenhouse gas emissions reductions from the EU by 2020, which would increase to 30 per cent as part of an international deal;**
- **a target of 20 per cent of energy in the EU to be sourced from renewables by 2020; and**
- **an enabling regulatory framework for carbon capture and storage and its inclusion in the EU Emissions Trading Scheme.**

The Government will continue to work with other Member States ahead of their EU presidencies to ensure that climate change and energy remain at the top of the EU agenda.

The Government is actively supporting work to expand and develop carbon markets, and promote the role of London as a key centre of expertise in carbon trading. The UK has worked closely with US states and other countries, and will be extending its engagement as more commit to action. The Carbon Markets Experts Group (which met for the first time in February) will discuss at its next meeting how linking international schemes would create a more liquid global carbon market.

6.7 At a global level, many of the major emerging economies are already taking steps to tackle the growth in their emissions. For example, China has begun to implement ambitious national goals on energy efficiency and renewable energy, and the Indian Government announced in its budget last month that it would take steps to improve energy efficiency, switch to lower carbon fuels, and develop platforms for emissions trading.

Bali conference 6.8 A strong international framework will enable countries to go further, setting out a level of ambition that is proportionate to the scale and urgency of the threat, particularly the threat to the world's most vulnerable countries and communities. G8 leaders agreed at Heiligendamm last year to set a global long-term goal for emissions reductions, and EU leaders have stated that this goal should be to reduce global emissions by no less than 50 per cent by

2050. In Bali last December, the UN launched a two-year process to negotiate the framework for climate change policy beyond 2012, including emissions reduction, technology, and adaptation.

Climate change and development **6.9** Development is an integral part of global efforts to tackle climate change. Global emissions cannot be reduced without helping developing countries move to a lower carbon growth path. And without action to tackle climate change, efforts to promote economic development and poverty reduction will be undermined. The Government's support to developing countries to tackle climate change sits within its broader commitment to tackle global poverty and achieve the internationally agreed Millennium Development Goals, supported by increases in DfID's 2007 CSR budget of 11 per cent in real terms.

6.10 In Bali, finance ministries agreed on the need to scale up finance to developing countries to help them tackle climate change through clean technologies, adaptation and avoiding deforestation. Carbon markets will play a major part in delivering that finance, and there will also be a greater role for the International Financial Institutions (IFIs), especially World Bank funds.

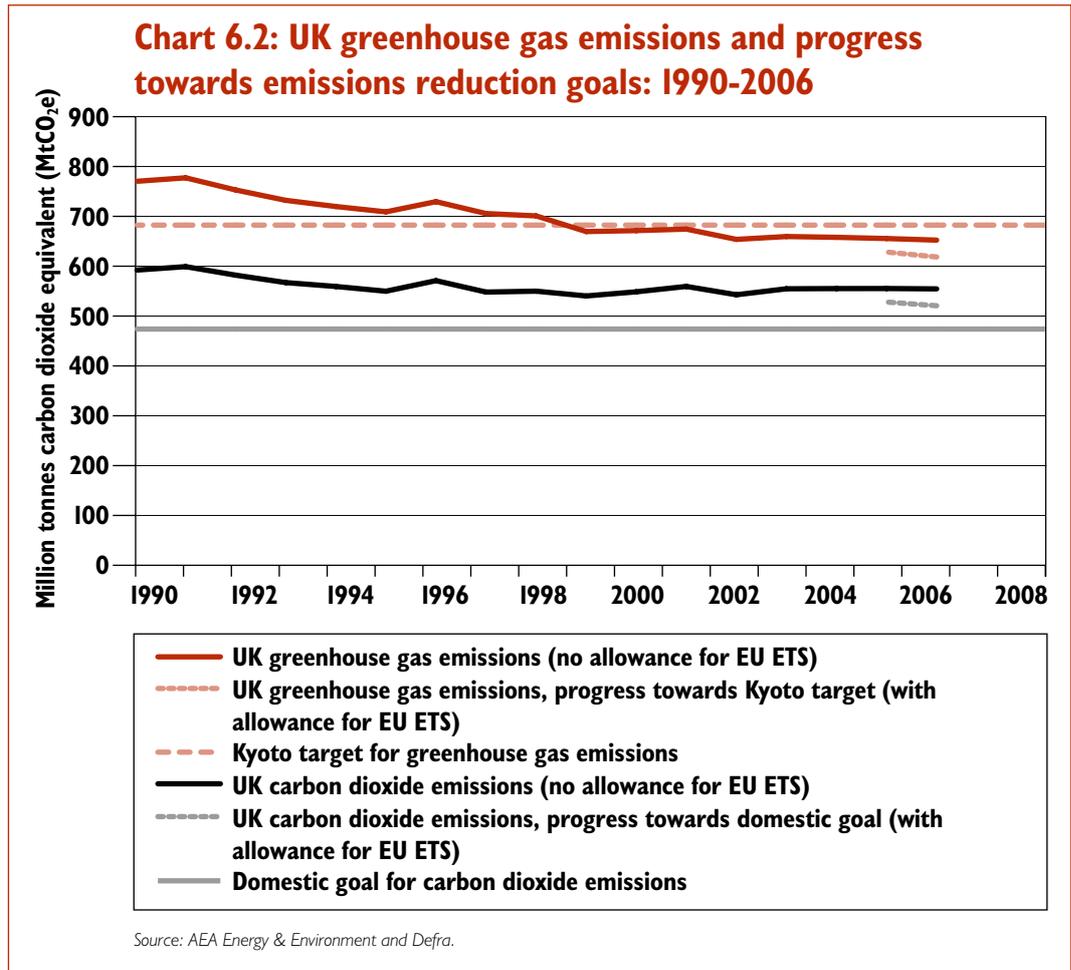
Environmental Transformation Fund **6.11** The UK has been working with the G7, including Japan, the US and other partners, on the creation of a strategic multilateral investment framework to help developing countries tackle climate change. **The UK will use its £800 million international Environmental Transformation Fund (ETF) with international partners to invest in clean technologies, help developing countries adapt to the impacts of climate change and act on deforestation.** One example of this work is the pledge made in Budget 2007, with £50 million of UK support for the Congo Basin Forest fund to save rainforests. This project aims to demonstrate the real environmental and poverty reduction results that well-targeted international finance can deliver.

Working in partnership with others **6.12** The UK has been supporting other countries and regions that wish to develop an economic analysis of climate change similar to the Stern Review. **The Government will work with the state of California to collaborate on investment in new energy technologies and to build links between emissions trading schemes.**

BUILDING A LOW-CARBON BRITAIN

6.13 However, international action on its own is not enough. The UK must show leadership domestically in order to help achieve progress in the negotiations and to reduce the UK's carbon footprint and meet the UK's commitments.

6.14 The Government has put in place a comprehensive set of measures to reduce greenhouse gas emissions and enhance the security and sustainability of the UK energy system. Since 1990, the Kyoto baseline year, UK greenhouse gas emissions have fallen by 19 per cent, including reductions through the EU Emissions Trading Scheme (see Chart 6.2).



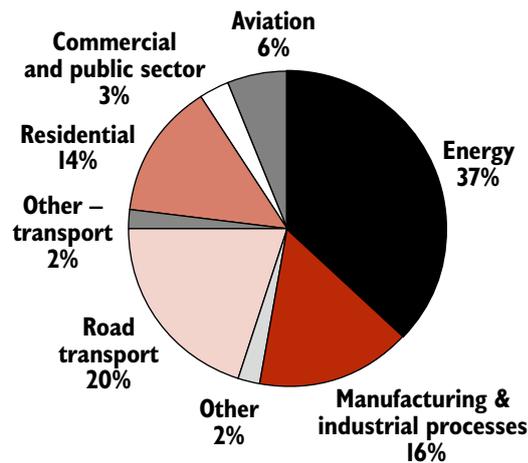
The Climate Change Bill **6.15** The Government believes that the scale of the challenge ahead means that it is right to go further. That is why the UK is putting in place new legislation that creates a radical statutory framework to make further deep cuts in emissions. The Climate Change Bill will commit the Government to living within fixed and binding five-year carbon budgets, based on the advice of the independent Committee on Climate Change. It is the first legislation of its kind in the world, establishing a system that will offer a credible, predictable and flexible path for British businesses and consumers to play their part in reducing the UK's carbon footprint.

6.16 Carbon budgets will provide a strong, clear focus for government decision-making on climate change policy and will set out for industry and individuals a pathway for the next 15 years. This will provide a clear signal for the investment and innovation needed to move towards a low-carbon economy without compromising the Government's objectives for economic growth. **Recognising the important economic and fiscal implications of the decisions required, the Government announces its intention to set out the carbon budgets and its plans to meet them alongside Budget 2009.**

Long-term targets **6.17** The UK currently has a long-term goal of reducing emissions of carbon dioxide by 60 per cent by 2050. The Prime Minister has asked the Committee on Climate Change to review whether this target should be raised, up to 80 per cent. The Government recognises the developing science of climate change, the risks associated with failing to achieve significant emissions reductions and the particular responsibilities placed on developed countries to achieve reductions. It also recognises that these cuts need to be achieved in the context of an international deal that requires action by all and a framework within which to act.

6.18 Meeting the UK's long-term targets will require working towards effectively decarbonising both power generation and transport in the UK. Carbon must be priced into investment decisions, further investment must be made in low-carbon technologies and policies must be put in place to change behaviour. Emissions need to be reduced in all sectors so as to equip them for the challenges of the future. Chart 6.3 shows the proportion of the UK's carbon dioxide emissions from each sector. This Budget takes action in all of the major sectors.

Chart 6.3: UK carbon dioxide emissions by sector (2005)



REDUCING EMISSIONS FROM THE TRANSPORT SECTOR

6.19 Transport is the second largest source of carbon dioxide emissions in the UK with around 28 per cent of UK carbon dioxide emissions. Due in part to sustained economic growth, emissions from transport are projected to continue growing until 2015. The Government's objective is to transform the transport sector to meet the demands of business and personal travel while reducing carbon emissions.

The King Review 6.20 Budget 2007 announced that Professor Julia King would lead a review to examine the vehicle and fuel technologies that, over the next 25 years, could help to decarbonise road transport, especially cars. In her report, Professor King makes recommendations in four key areas where she believes action must be taken if the UK is to move towards decarbonising road transport:

- reducing vehicle emissions;
- changing consumer behaviours;
- encouraging cleaner fuels; and
- research and development.

6.21 **The Government welcomes the final report of the review, published alongside this Budget. A detailed Government response to the review will be published in the summer.** This Budget sets out the action Government is taking forward under the four key areas of the review.

Box 6.2: Budget 2008 and the King Review

Budget 2008 measures include:

- significant reform of vehicle excise duty to incentivise motorists to purchase fuel efficient vehicles;
- improving the information available for consumers;
- a £40 million research, development and demonstration programme for low-carbon vehicles, jointly funded by the Technology Strategy Board, the Engineering and Physical Sciences Research Council and the Department for Transport;
- encouraging the development and use of the cleanest and most sustainable biofuels by switching support to the Renewable Transport Fuel Obligation and by pushing for a sustainable EU biofuel policy;
- establishing international collaboration with the Indian Government to develop low cost, low-carbon vehicles; and
- pushing for a longer-term EU target for vehicle manufacturers to reduce average carbon dioxide from new cars to 100g carbon dioxide per km in 2020.

Cleaner and more efficient vehicles

6.22 The King Review has found that there are existing technologies that can be used to save carbon dioxide now, and opportunities to develop new technologies that can deliver the vehicles that will be needed in a low-carbon world. The Budget announces measures to incentivise both short and long-term action.

Carbon dioxide from cars **6.23** The European Union has established voluntary agreements with car manufacturers to reduce average carbon dioxide emissions from new cars to 140g per km by 2008-09. It is becoming clear that this target will not be met. The European Commission therefore published a proposal last year to set car manufacturers a mandatory target to reduce average new car carbon dioxide emissions to 130g per km by 2012. **The Government will ask the EU to set a longer-term target to reduce the average new car carbon dioxide emissions to 100g per km by 2020.**

Consumer behaviour

6.24 The Government is committed to ensuring that motorists have the clearest information to inform their purchasing choices. The 'Act on CO₂' campaign in its first year has helped to provide motorists with this information. To take this further, the King Review recommends:

- the introduction of colour-coded car tax discs;
- the strengthening of advertising regulation to provide clearer information on vehicles;
- redesigning and making compulsory the current new car fuel economy label; and
- considering whether dashboard technology can encourage smarter driving.

6.25 The Government announces today that the Department for Transport will actively explore these ideas in collaboration with external stakeholders through the Low Carbon Vehicle Partnership.

Vehicle excise duty **6.26** Fiscal measures also have an important role to play and can highlight the environmental impacts of different vehicles at the point people purchase them.

6.27 Analysis from the King Review suggests that there is a wide range of environmental performance within a particular group of cars (such as family saloons or hatchbacks). Drivers could reduce carbon dioxide emissions and fuel bills by up to 25 per cent by choosing the most efficient vehicle in its group. The review also concluded that over the long-term the technology exists to reduce the average carbon dioxide emission of new cars to 100g per km by 2020.

6.28 In order to support this target, and strengthen the environmental incentive to develop and purchase fuel-efficient cars, **Budget 2008 announces reform of the vehicle excise duty (VED) structure. From 2009, VED will be restructured with new bands, based on carbon dioxide so that people gain financially by choosing the car with the best environmental performance in a given group. The financial difference between the most and least polluting cars will increase, so that making a small change in car emissions has a greater financial impact. From 2010, there will be a new higher first-year rate based on carbon dioxide emissions, to influence purchasing choices. Specific changes include:**

- six new VED bands from 2009-10 – including a new top band (band M) for the most polluting cars that emit more than 255g CO₂ per km;
- reducing the standard rate of VED, in 2009-10, for all new and existing cars that emit 150g of CO₂ per km or less, and increasing the standard rate of VED on the most polluting cars to £425;
- from 2010-11, extending the zero rate of VED, during the first year of ownership, to all new cars that emit 130g CO₂ per km or less – the EU proposed target for average new car emissions in 2012;
- holding the first-year rate for all new cars that emit between 131 and 160g CO₂ per km equal to the standard rate in 2010-11;
- introducing for the most polluting cars a first-year rate of £950 in 2010-11; and
- providing a £15 or £20 discount for alternatively fuelled cars in 2009-10, and £10 in 2010-11; and aligning the alternative fuel and standard rates of VED in 2011.

6.29 As a result of these reforms, the majority of motorists will be better or no worse off in 2009. Chapter A provides further details of the new VED structure.

Box 6.3 Taxation of business travel

Company car tax was reformed in 2002 and is now based on carbon emissions, encouraging the take up of more fuel-efficient cars in company fleets. **Budget 2008 announces that the Government will further promote more environmentally-efficient business travel and the take up of cleaner cars through:**

- replacing the existing capital allowance treatment for business cars with an emissions-based approach. Cars will be placed in one of two capital allowance pools according to their CO₂ emissions, with cars whose emissions are above 160g per km receiving a lower allowance. 100 per cent first-year allowances will continue to be available for cars with CO₂ emissions not exceeding 110g per km;
- increasing company car tax rates on all but the cleanest cars emitting less than 135g CO₂ per km in 2010-11;
- enhancing the incentives to drive fewer miles through changes to the fuel benefit charge from April 2009;
- offering a lower VED rate for diesel vans that comply with EU air-quality emission standards; and
- maintaining tax-free mileage allowances (AMAPs) rates and thresholds at current levels. The Government will take decisions on whether to align the tax/National Insurance Contribution treatment of AMAPs in light of the outcome of the HMRC consultation on collecting tax on benefits in kind and expense payments: *Including benefits in kind and expense payments in the payroll – a fresh approach.*

Further detail on these measures can be found in Chapter A.

Fuel duty 6.30 It is the Government's policy that fuel duty rates should rise each year at least in line with inflation as the UK seeks to reduce polluting emissions and fund public services. **Budget 2008 therefore confirms that main road fuel duty rates will rise by 1.84 pence per litre on 1 April 2009, and announces that rates will then also increase by 0.5 pence per litre above indexation on 1 April 2010.** By 2010-11, main fuel duty rates will remain at least 11 per cent lower in real terms than they were in 1999. Consistent with the Government's overall stance of ensuring stability for the long-term, while maintaining responsiveness to short-term conditions, **Budget 2008 also announces that the planned fuel duty increase of 2 pence per litre in April 2008 will now take place on 1 October 2008. The Government can also confirm that rebated oils duty increases will also be deferred until 1 October 2008, when they will rise in proportion to main road fuel duties. These rates will also rise by the same proportion as main road fuel duties in the subsequent two years.**

Public transport 6.31 Public transport has an important role to play in reducing emissions. Public support for buses has risen to £2.5 billion this year, with further funding to allow free off-peak nationwide travel for pensioners and the disabled from April 2008. The Secretary of State for Transport will shortly publish a consultation document on the reform of bus subsidy, with proposals targeted at delivering carbon dioxide savings to support climate change goals and modernising bus services, through incentives for new technology.

Encouraging cleaner fuels

Biofuels 6.32 The King Review highlights that in the longer term, biofuels have the potential to make a significant contribution towards reducing emissions in the transport sector. Biofuels are produced from a wide range of sources, including maize, rapeseed and sugar cane. In principle,

biofuels can reduce greenhouse gas emissions compared to the use of fossil fuels. However, factors including land use changes, fertiliser inputs, processing methods and transport can significantly reduce the greenhouse gas emission savings available (see Table 6.1 which shows the carbon dioxide reduction of different sources of biofuels compared to gasoline).

Table 6.1: Carbon dioxide reduction of different sources of biofuels¹

Biofuels Feedstock	Bioethanol			Biodiesel	
	Cereals, corn	Sugar beets	Sugar cane	Ligno- cellulosic	Vegetable oils
CO2 reduction compared to gasoline/diesel (per cent)	15–25	50–60	90	70	40–60

¹ The possible ranges of greenhouse gas savings could be wider than implied by the IEA's work due to emissions related to fertilizer use and potential land use change from growing demand for biofuels. For example:

- nitrogen fertiliser releases nitrous oxide, a greenhouse gas 210 times more potent than carbon dioxide, both during its production and when applied to crops;
- land use change, for example releasing carbon stocks from soil as previously uncropped land is ploughed, is also a key source of carbon emissions from biofuel feedstock cultivation; and
- there are also emissions associated with processing feedstocks into fuels, which vary according to the processing requirements and the energy source (e.g. coal power station versus renewable energy).

Source: IEA

6.33 The Government believes that it is important that policy supports sustainable biofuels. The Secretary of State for Transport announced that Ed Gallagher, chairman of the Renewable Fuels Agency, would lead a study of the wider economic and environmental impacts, including the impacts on food prices, of different forms of biofuel production. **Tomorrow the Secretary of State for Transport will publish the terms of reference of the review.**

6.34 The Government announced in the Pre-Budget Report 2005 that it would introduce the Renewable Transport Fuel Obligation (RTFO) from 2008. The existing duty differential for biofuels has limited scope to recognise different biofuels, whereas the newer RTFO will provide a sharper environmental focus through its sustainability criteria. **To encourage the development of the cleanest, most sustainable biofuels the duty differential for biofuels will cease in 2010. The RTFO buy out price will be set at 30 pence per litre, providing a better incentive for biofuels.**

6.35 The European Commission has proposed that at least 10 per cent of all fuel must be sourced from biofuels by 2020. **Today the Chancellor and the Secretaries of State for BERR, DFID, Defra and DfT have written to the European Commission to outline the principles on which the UK believes EU biofuel policy must be based. These are that:**

- **reducing greenhouse gas emissions must be at the heart of EU policy;**
- **targets must be set at the appropriate level, taking into account the indirect impacts of biofuels, and must be revised if they cannot be met in a sustainable or cost-effective manner;**
- **robust sustainability standards must be in place;**
- **EU policy must ensure a level playing field between domestic and international producers – in particular unfair EU biofuel import tariffs should be abolished; and**
- **in line with the UK's position on vehicle efficiency standards, the EU must get the balance right between encouraging biofuels and decarbonising cars.**

Research and development

6.36 The King Review concluded that the UK could reduce car carbon dioxide by using existing technologies, and also by pioneering new technologies to develop the vehicles of the future. **The Budget announces a £40 million research, development and demonstration programme, which will focus on low-carbon vehicle concepts and the acceleration of their commercialisation.**

6.37 The review recommends that a new research, development and demonstration programme be established between the UK and India to support a consortium of companies and universities to develop a 'low-cost, low-emission' car. **The UK Government accepts this and has today written to the Indian Government seeking their support for a collaborative programme.**

Aviation

Air passenger duty 6.38 Aviation accounts for 6.3 per cent of the UK's carbon dioxide emissions. This is projected to rise to as much as 21 per cent by 2050. The Government is committed to enabling the aviation industry to expand in an environmentally sustainable way, ensuring that it pays the external costs that its activities impose on society at large, as well as contributing fairly to public services. For this reason, at Pre-Budget Report 2007, the Government announced that air passenger duty would be replaced by a duty payable per plane, rather than per passenger, from 1 November 2009. This will send better environmental signals and ensure that aviation duty better reflects environmental costs. The Government began a consultation³ on the design of the new duty in January and welcomes responses by 24 April. **In order to strengthen the environmental signal through taxation, this Budget announces that the Government will increase forecast tax revenues from the new per plane duty by 10 per cent in the second full year of operation.**

Aviation in EU ETS 6.39 The UK Government is confident that agreement will be reached on the inclusion of aviation in the EU Emissions Trading Scheme by 2012, which will help to ensure that right across Europe the aviation sector plays its part in delivering real carbon reductions.

REDUCING EMISSIONS FROM THE ENERGY SUPPLY SECTOR

6.40 Energy supply is the UK's single biggest contributor to carbon dioxide emissions. The Stern Review estimated that the global power sector will need to be at least 60 per cent decarbonised by 2050 to meet the climate goals and that much deeper reductions would be required by developed countries.

Energy policy framework

Energy White Paper 6.41 The Government's climate change and energy policy objectives go hand in hand. The Energy White Paper, published in May 2007, sets out the Government's framework for energy policy to reduce energy-related emissions, ensure that supplies of energy are secure in a changing world, improve energy efficiency, and tackle fuel poverty so that the most vulnerable in society are able to pay their bills in a world of higher energy prices.

6.42 The Government's strategy is based on the principle that independently regulated, competitive energy markets are the most cost-effective and efficient way of delivering the objectives for the energy sector. The role of Government is to set the framework and remove barriers for investors to enable a wide range of technologies to be deployed by the private sector.

³Aviation duty: a consultation, HM Treasury and HM Revenue and Customs, 31 January 2007

Renewables 6.43 The UK is committed to tripling the contribution made by renewable electricity by 2015. The European Commission has now brought forward an EU-wide target for 20 per cent of energy production to come from renewable sources by 2020, and the Government will consider a wide range of measures to enable the UK to play its part. **In the summer, the Government will launch a full consultation on what more the UK should do to increase renewable energy use and meet its share of the EU target. The Government will also consult on the most appropriate support mechanism for microgeneration at individual and community level, including the option of a feed-in tariff. The Government will also consider how to address barriers such as planning and grid access.**

Carbon pricing

EU ETS 6.44 Carbon pricing through the EU Emissions Trading Scheme (EU ETS) ensures that energy generators face the cost of their emissions and helps to reduce emissions in the business and energy supply sectors in an effective and least-cost way.

6.45 In the initial phases of the EU ETS, most allowances have been distributed for free. This gives participants a period of transition and recognises that many of their investment decisions were taken before trading was introduced.

6.46 In the longer term, the free distribution of allowances can reduce the incentives for firms to reduce emissions because they do not face the full financial cost of carbon emissions. Auctioning of allowances is the most efficient way to avoid this. The UK is one of the Member States going furthest on auctioning in Phase II, within the limits set by the EU Directive. The UK continues to urge the European Commission to put in place a flexible framework that allows Member States to go further on auctioning in future phases. **Budget 2008 announces that in Phase III the UK will auction 100 per cent of allowances to the large electricity producers' sector.**

Technology policy

6.47 The UK wants the EU to agree a more ambitious emissions trading scheme to serve as the basis for an effective global carbon market. A market price for carbon will help to encourage a change in investment patterns towards a low-carbon energy sector. However the Stern Review was clear that carbon pricing alone will not be sufficient to reduce emissions on the scale and pace required. The risks around climate change and the newness of many of the technologies mean that there is a case for government intervention to support investment earlier in innovation.

Energy Technologies Institute 6.48 The Energy Technologies Institute (ETI), announced in Budget 2006, has now been legally established. A 50:50 partnership between Government and industry, its current membership of BP, Caterpillar, EDF Energy, E.ON UK, Rolls-Royce and Shell aims to raise up to £1.1 billion over ten years for transformational research and development in low-carbon energy technologies. To make the most of the potential that exists in the UK's natural resources, **Budget 2008 announces that the first projects supported will be on offshore wind (a £40 million fund joint with the Carbon Trust) and marine, wave and tidal (up to £20 million).**

Environmental Transformation Fund 6.49 The domestic Environmental Transformation Fund (ETF) allocates over £400 million to ensure that technologies that are in the later stage of development can be brought to market and demonstrated. It is the Government's intention that the ETF is a genuinely transformational fund that works closely with the ETI, research councils and other funding bodies, as well as internationally, to coordinate support across the technology chain. **In the summer, the Government will publish a low-carbon technology strategy, which will detail how the**

coordination of existing and new schemes can maximise the UK's efforts in developing the right technologies to tackle global climate change.

Box 6.4 The domestic Environmental Transformation Fund: allocations

- Carbon Trust technology programmes (over £90 million) – including offshore wind (joint with ETI), 3rd generation solar photovoltaic, sustainable bioenergy and low cost fuel cells;
- energy efficiency demonstration and deployment (over £45 million) – including trials and loans for energy saving in the public sector, small businesses and households; and
- renewable energy and low-carbon technologies (at least £200m) – including offshore wind, marine, bioenergy, anaerobic digestion, microgeneration, carbon abatement technologies, hydrogen and fuel cells – including CCS.

Carbon capture and storage **6.50** The Stern Review highlighted carbon capture and storage (CCS) as a key technology for tackling global carbon emissions. CCS has the potential to reduce carbon emissions from fossil fuel power stations by 90 per cent.

6.51 The UK is taking a lead in demonstrating the technologies at a commercial scale, by launching a competition to design and build the world's first post-combustion coal CCS power station. Bidders will submit responses to pre-qualification criteria by the end of this month – the first step in the process of having an operational CCS power station by 2014. This project creates opportunities for UK industry in constructing and maintaining the plant, designing the capture technology and building transport infrastructure and injection into the carbon store. **Alongside the UK competition, BERR will shortly announce a new call for expressions of interest under the Environmental Transformation Fund to support the development of component parts of CCS.**

6.52 The Government is also developing the regulatory framework for CCS in the UK. The Energy Bill will enable carbon to be captured in the UK and stored in the North Sea. **The Government will shortly be launching a consultation on CCS regulations as well as what it would mean for a new coal-fired power station to be 'capture ready', (i.e. to be in a position to retrofit CCS technology once it is proven at a commercial scale), and whether all new fossil fuel power stations should demonstrate that they are capture ready.**

REDUCING EMISSIONS FROM THE BUSINESS AND PUBLIC SECTOR

6.53 Industry, business and the public sector contribute 19 per cent of the UK's carbon dioxide emissions. Measures in the energy supply sector will help to decarbonise the energy inputs in this sector, but reducing energy demand is also important. Many businesses are already taking action to improve their energy efficiency.

Climate change levy and climate change agreements **6.54** The climate change levy (CCL) is the centre of the Government's policy approach. It was introduced in 2001 to encourage businesses to reduce their energy demand. Climate change agreements (CCAs) provide businesses, in over 50 energy-intensive sectors, with an 80 per cent discount from the levy in return for improving energy efficiency and/or reducing emissions. Independent analysis by Cambridge Econometrics estimates that by 2010 the levy will have reduced energy demand in the commercial and public sector by around 15 per cent a year delivering savings of around 12.8 MtCO₂ a year. By 2010, it is estimated that CCAs will deliver savings of around 7 MtCO₂ a year. As announced at Pre-Budget Report 2007, the Government intends to extend the CCA scheme until 2017, subject to state aid approval.

6.55 Budget 2007 announced that CCL rates will increase in line with inflation from 1 April 2008 to maintain the levy's environmental impact. **Budget 2008 announces that CCL rates will also be raised in line with inflation from 1 April 2009.**

Energy services 6.56 Energy Service Companies (ESCOs) promote energy efficiency by providing information, finance and installation of energy-saving measures through long-term energy service contracts. By linking their income to energy savings achieved, these contracts save both emissions and costs.

6.57 To help develop the energy services market and support businesses, **Budget 2008 announces that the Government will:**

- **develop voluntary agreements with all energy suppliers to promote the market for energy services.** Suppliers will be expected to develop, trial and promote innovative service packages, commit to better data sharing and monitor their impact;
- **work with businesses to promote knowledge of energy services.** As a first step, the Chancellor will host a summit, bringing together energy service providers and energy suppliers with business groups to promote the market and consider ways to encourage uptake;
- **require energy suppliers to provide smart meters for medium and large businesses within the next five years** to improve information on energy consumption and help support the energy services market; and
- **lead by example in developing the energy services market.** Government procurements should capture the benefits of energy services in the public sector.

Zero carbon buildings 6.58 In the 2006 Pre-Budget Report the Government announced its ambition for all new homes to be zero carbon by 2016. This Budget sets out further measures to help delivery of the zero carbon home ambition (paragraph 6.73). The Government has been working with the UK Green Building Council to develop plans to reduce emissions from new non-domestic buildings down to zero.

6.59 **It is the Government's ambition that all new non-domestic buildings be zero carbon from 2019. The Government will consult this year on the timeline for this ambition and its feasibility, and review progress in 2013.** Achieving this goal will establish Britain amongst the world leaders in the field and make a significant contribution toward mitigating climate change by saving approximately 75 MtCO₂ in the next thirty years.

6.60 The Government is taking action to reduce the carbon dioxide impact of public sector buildings. It is already the Government's ambition that all new schools are zero carbon from 2016, and a taskforce is being set up to advise on how to achieve zero carbon schools, whether the timescale is realistic, and how to reduce carbon emissions in the intervening period. **Today the Government announces an ambition for all new public sector buildings to be zero carbon from 2018.** There are key barriers that will have to be overcome in the coming months and years to deliver this, and there may be areas where achieving zero carbon presents particular challenges. **The Government will therefore establish a taskforce to advise on the timeline, how to reduce carbon emissions in the intervening period, and the particular challenges faced in some sectors such as hospitals, prisons and defence establishments.**

6.61 The Government is also putting in place policies to help reduce the carbon dioxide impact of the existing building stock. Many existing buildings that business and the public sector occupy were not designed with energy efficiency in mind. The 2007 Pre-Budget Report

announced that microgeneration investments would not be subjected to ad hoc reassessments of business rates liability; **Budget 2008 confirms that this will be implemented from 1 October 2008. The Government will also consider the merits of the further use of fiscal instruments to promote energy efficiency in non-domestic buildings.**

Sustainable public sector procurement 6.62 In order to drive up standards in sustainable procurement for public sector buyers, **the Government is publishing a new policy framework for procurement including practical guidance on how procurers can take the environment into account; will set up a new Centre for Expertise in Sustainable Procurement; and will shortly set out plans to make the Government's use of IT more sustainable.**

REDUCING EMISSIONS FROM THE HOUSEHOLDS SECTOR

6.63 Households account for around a quarter of the UK's energy consumption and 14 per cent of carbon dioxide emissions. Households are also the sector where some of the most cost-effective opportunities for emissions reductions exist: individuals can take action within their own homes that both reduces their impact on the environment and reduces their energy bills. Budget 2008 aims to support and encourage individuals to take action themselves now and in the short-term; and to set standards for new homes that will support zero carbon lifestyles in future.

Products 6.64 Individuals can reduce emissions by the choices they make when using electrical equipment or buying products. Reducing the energy consumed by appliances on standby, and improving the energy efficiency of the products used in homes and offices provides one of the most cost-effective ways to meet the Government's climate change and energy goals.

6.65 In 2007, the Government announced that major retailers, with the support of manufacturers and energy companies, have agreed the ambition to phase out inefficient incandescent light bulbs by 2011, as well as looking at other possible voluntary agreements. The Government is consulting on standards and targets for other products.

Reducing emissions from homes 6.66 Much of the UK's existing housing stock is not designed to be energy-efficient. People can play a major part in reducing emissions by taking simple steps to improve insulation in their homes, making homes more affordable to heat and reducing wasted energy. Budget 2008 highlights existing schemes to help people lower their carbon footprint and save money, and announces new measures to encourage further action.

6.67 One of the key schemes that supports householders in making their homes more energy efficient is the Carbon Emissions Reduction Target (CERT). This scheme obliges energy suppliers to install energy efficiency measures like loft and cavity wall insulation in homes, with estimated spending of £2.8 billion.

Box 6.5 – The Carbon Emissions Reduction Target (CERT)

The Carbon Emissions Reduction Target (CERT) is the latest phase of the successful Energy Efficiency Commitment programme – a scheme that obliges energy suppliers to install energy efficiency measures and promote reductions in carbon emissions for households. CERT will deliver a step change in emissions reductions, delivering carbon dioxide savings of 154 MtCO₂ over 40 years (the projected lifetime of the measures). The scheme will not only help reduce emissions but will lower energy bills. CERT obliges energy suppliers to direct at least 40 per cent of carbon dioxide savings to a priority group of people on low incomes and the over 70s. It is estimated that £1.5 billion of efficiency measures might be spent on the priority group. Energy suppliers can lose their licences if they do not meet the targets. The most likely mix of measures, based on information from energy suppliers, industry representatives and experts, will include the following major installations (over the next three years):

- cavity wall insulation in 1.2 million homes in the priority groups, and 2.9 million homes in total. By the end of CERT approximately half of fillable homes should have been insulated;
- loft insulation installed in 1.1 million homes in the priority group and 2.7 million homes in total;
- 31 million energy-efficient light bulbs provided to priority groups and 110 million such light bulbs in total; and
- fuel switching (mainly from electric to gas central heating) in 90,000 homes in priority groups and in 160,000 homes in total.

6.68 The Green Homes Service, announced by the Prime Minister in November 2007, will be launched on 1 April. The service will help people improve the energy efficiency of their homes, choose lower emissions transport, reduce waste and conserve water. It will direct people to the practical steps they can take, and to the full range of support available, including help through CERT. **Budget 2008 announces the allocation of £26 million to the Green Homes Service in 2008-09, helping over two million people in its first year. Budget 2008 also announces that, in order to support effective delivery and to harness the enthusiasm and expertise of community groups and other interested parties, the Government will convene a Green Homes Forum in the autumn.**

6.69 The Government is supporting a collaborative research programme in Materials for Energy, including better insulation for solid walls, with the successful projects to be announced next month. **The Government is also interested in exploring what more can be done to raise awareness amongst the public of the ways and benefits of improving domestic energy efficiency, and to find ways to make solid wall homes more efficient.**

Green electricity 6.70 Consumers can help to reduce emissions now by switching tariffs to green electricity. The Government is keen to ensure that there is clear information for customers on the environmental impacts of different sources of green electricity. **Ofgem will be publishing a set of guidelines in the summer that will give customers greater confidence on the environmental benefits of their tariff.**

Microgeneration 6.71 Microgeneration technologies, such as solar heating and small wind turbines, which can be used at household and community level, have the potential to make an increasingly important contribution over the next few years, to both improved energy security and lower carbon emissions. The Government will continue to work with Ofgem to make it easier for people to comply with relevant regulations.

6.72 On 11 March Ofgem published a report into the microgeneration market in which they noted that there are barriers to consumers obtaining the best rewards from microgeneration. In particular, there is currently no way to compare the prices offered by different companies for selling electricity back to the grid. **The Government will be working with the Energy Saving Trust, Ofgem and energy suppliers to provide this information impartially to consumers.**

Zero carbon homes **6.73** For the longer-term, the Government has outlined its ambition that from 2016 all new homes would be zero carbon. In Pre-Budget Report 2006 the Government announced a time-limited Stamp Duty Land Tax exemption for new zero-carbon homes from 1 October 2007. **This Budget includes further action to meet the Government's 2016 zero-carbon homes ambition:**

- for the homebuyer, the **Government will extend the Stamp Duty Land Tax exemption to new flats, retrospectively from 1 October 2007**, and will make changes to provide for Government departments to charge a fee when assessing whether a dwelling meets the zero-carbon standard;
- to give the construction industry the certainty it requires to prepare for delivering the ambition, **the Government will set out the definition for a zero-carbon home for the purposes of the 2016 ambition by the end of 2008, following a consultation in summer;**
- to drive progress against the ambition the **Government will provide pump-prime funding for a new 2016 delivery unit that will launch this year to guide, monitor and coordinate the zero-carbon programme; and**
- to ensure opportunities to reduce carbon emissions from new housing between now and 2016 are taken up **all new homes built on central government land released through the surplus public sector land programme from April 2008 will reach a minimum of Level 3 of the Code for Sustainable Homes.**

PROTECTING THE UK'S COUNTRYSIDE AND NATURAL RESOURCES

6.74 The Government recognises the importance of protecting and enhancing the natural environment so that domestic growth is more environmentally sustainable.

6.75 It is important to reduce the UK's vulnerability to the impacts of climate change that are already occurring and to prepare for more significant changes to come. As part of new duties introduced under the Climate Change Bill, the Government will produce a strategic risk assessment on the impacts of climate change, looking more than 50 years ahead, and will develop a comprehensive programme to respond to these risks.

Landfill tax **6.76** Landfill tax increases the price of waste sent to landfill, encouraging more sustainable ways of managing waste. The tax – working with other measures – has been successful with overall quantities of waste recorded at landfill sites registered for the tax falling by around 26 per cent. The UK is on track to meet its 2010 targets under the Landfill Directive.

6.77 As announced in Budget 2007, from 1 April 2008 and until at least 2010-11, the standard rate of landfill tax will increase by £8 per tonne each year. In Budget 2007, the Government also announced that the lower rate, applying to inactive waste, will also increase from £2 to £2.50 per tonne from 1 April 2008. The Government expects the standard rate to continue to increase beyond 2010-11. **However, the Government announces today that the lower rate will be frozen at £2.50 per tonne in 2009-10.**

6.78 As set out in Chapter 5, the Government is introducing measures to reform the tax incentives for brownfield sites. As part of this, the Government will remove the exemption from landfill tax for waste arising from the clearance of contaminated land. The revenue derived from removing this exemption will be used to extend land remediation relief. The exemption will be phased out by 1 April 2012.

Landfill communities fund **6.79** The landfill communities fund redresses some of the environmental costs of landfill by improving the environment near landfill sites. Since its introduction in 1996, over £800 million has been spent through the scheme, with over 22,000 projects funded. **The Government today announces that the value of the fund will be increased by £5 million to £70 million for 2008-09. It will also be amending the regulations to reduce the administrative burden on environmental bodies by relaxing their reporting requirements. The Government will also transfer the authority to revoke the enrolment of environmental bodies from the fund's regulator to HMRC.**

Single-use carrier bags **6.80** The Government has already called on retailers to take voluntary action to encourage the shift away from single-use carrier bags. Given the damage that single-use bags inflict on the environment, the Government is committed to taking strong action. **Budget 2008 announces that the Climate Change Bill will legislate so that, if there is not sufficient progress on a voluntary basis by the end of the year, the Government can exercise powers early next year to impose a charge on these bags.**

6.81 **The Government will consult in the meantime on the operation of the charge and how to ensure that any money raised goes to environmental charities. The Government will ensure that donations made by retailers to charitable causes out of any money raised will attract tax relief in the normal way.**

Enhanced capital allowances for waste **6.82** As announced in Budget 2007 the Government has reviewed the classes of equipment that can qualify for enhanced capital allowances (ECAs) for good quality combined heat and power (CHP) to ensure that the scheme includes all necessary equipment for CHP facilities to use solid refuse fuel. This work is now complete and the qualifying criteria will be revised accordingly and incorporated in new lists, which will be published later in 2008.

Aggregates levy **6.83** The aggregates levy was introduced in 2002 to ensure that the external costs associated with the exploitation of aggregates are reflected in the price of aggregate, and to encourage the use of recycled aggregate. There is strong evidence that the levy is achieving its environmental objectives – between 2001 and 2005, sales of virgin aggregate in Great Britain reduced by around 18 million tonnes, with an estimated increase in the use of recycled aggregate in England of nearly 6 million tonnes.

6.84 In Budget 2007, the Government announced that the levy will increase from £1.60 per tonne to £1.95 per tonne from 1 April 2008, reflecting inflation since the introduction of the levy. **The Government announces today that the levy will increase from £1.95 per tonne to £2.00 per tonne from 1 April 2009, to maintain its environmental impact.**

Table 6.2: The environmental impacts of Budget measures

Budget measure	Environmental impacts
Climate change and air quality	
Climate change levy package	The climate change levy is estimated to deliver annual emissions savings of over 12.8 million tonnes of carbon dioxide by 2010 ¹ . Climate change agreements are estimated to deliver annual emissions savings of around 7 million tonnes of carbon dioxide by 2010.
Carbon capture and storage	Carbon capture and storage demonstration is expected to deliver savings of around 0.7 MtCO ₂ per year by 2020.
Fuel duty	Fuel duty increases announced for 2008 to 2010 are expected to result in carbon savings of around 0.5 MtCO ₂ a year by 2010-11.
Support for biofuels	The RTFO is expected to save between 2.6-3 MtCO ₂ in 2010-11 ² .
Abolition of biofuels duty differential	Expected to deliver annual emissions savings of 0.3 MtCO ₂ in 2012-13.
Rebated fuels	Maintaining the relative differential with main road fuels will deliver small CO ₂ and local air pollution benefits through increased use of less polluting fuels and less use of rebated fuels, which are more polluting.
Vehicle excise duty (VED)	The environmental signals provided by VED will help deliver reductions in CO ₂ emissions. The numbers of vehicles in the lowest CO ₂ emission graduated VED bands are forecast to grow significantly in the longer term in part due to VED reform.
VED incentives for Euro V/VI vans	Encouraging the early take-up of cleaner emissions Euro V diesel vans is expected to deliver accelerated air quality benefits, resulting from lower nitrous oxide and particulate matter emissions of Euro V compliant diesel vans compared to Euro IV equivalents.
Company car tax (CCT)	CO ₂ emissions savings of the 2005 reformed CCT system are estimated to be significant, and are forecast to rise to between 1.5 and 3.3 MtCO ₂ per year in the long run ³ .
Company car fuel benefit charge (FBC)	The number of company car drivers getting free fuel for private use has fallen by around 600,000 since 1997, partly as a result of changes to the company car tax system in April 2002 and changes to the fuel benefit rules in April 2003, helping to reduce levels of CO ₂ emissions, local air pollutants and congestion ⁴ . Increasing the FBC in line with the changes in the retail prices index in 2008-09 will deliver a small additional reduction in CO ₂ emissions.
Introduction of aviation duty and increase in revenue in 2011-12	CO ₂ emissions savings from the increase in aviation taxation are estimated to be approximately 0.75 MtCO ₂ in 2011-12. In addition, there will be further environmental savings caused by a reduction in other negative environmental impacts, including air quality and noise emissions.
Package to encourage energy service companies	Smart Metering, and benefits from other policies, expected to deliver 0.5 MtCO ₂ a year by 2020 ⁵ .
Zero carbon homes	Small reductions in emissions.
Non-domestic buildings	Ambition for all new non-domestic buildings to be zero carbon from 2019. Estimated to save 75 MtCO ₂ in the next thirty years.
Landlords Energy Saving Allowance (LESA)	Small reduction of carbon emissions.
Reduced rate of VAT on professionally-installed energy saving materials and microgeneration (from 17.5% to 5%)	Small reduction of carbon emissions.
Reduced rate of VAT on domestic fuel and power (from 8% to 5%)	Estimated to increase carbon emissions by 0.7 MtCO ₂ by 2010 ⁶ .
Protecting the UK's countryside and natural resources	
Landfill tax	Between 1997-98 and 2006-07, the total quantity of waste disposed to landfill sites registered for landfill tax fell by 26 per cent, while the amount of active waste disposed to landfill fell by almost 19 per cent ⁷ . The landfill tax is expected to save up to 0.2 MtC a year by 2010.
ECAs for waste	Incentivising a market for solid refuel fuel, to encourage more sustainable alternatives to landfill.
Landfill communities fund	The landfill communities fund has provided over £800 million for projects since its introduction.
Aggregates levy and aggregates levy sustainability fund	An 8 per cent reduction in sales of aggregates in the UK between 2001 and 2005. An increase of nearly 6 million tonnes of recycled aggregates in England. Reductions in noise and vibration, dust and other emissions to air, visual intrusion, loss of amenity and damage to wildlife habitats.

ECAs for energy and water-efficient technologies	More sustainable water and energy use by business.
Reform of Land Remediation Relief and phasing out of landfill tax exemption for waste arising from the clearance of contaminated land.	Providing enhanced support for the clean up of contaminated and derelict land in a more environmentally sustainable manner

¹ Modelling the initial effects of the Climate Change Levy, Cambridge Econometrics, available at www.hmrc.gov.uk

² DfT.

³ HMRC modelling.

⁴ HMRC modelling.

⁵ BERR (Energy billing and metering, Changing Consumer Behaviour: A Consultation on Policies Presented in the Energy White Paper (August 2007))

⁶ HMRC modelling

⁷ Data at www.uktradeinfo.com, in calendar years.
