UK Energy Efficiency Action Plan 2007

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Contents

1. The recently-published Energy White Paper, Meeting the Energy Challenge[1], set out two long term challenges:

   - tackling climate change by reducing carbon dioxide emissions both within the UK and abroad; and
   - ensuring secure, clean and affordable energy as we become increasingly dependent on imported fuel.

   Using energy more efficiently is the fastest and most cost effective way of cutting carbon dioxide emissions. It can also improve productivity and can contribute to the security of our energy supplies by reducing our reliance on imported energy and ensuring we make maximum use of our own and global energy resources. Improving the energy efficiency of homes can also reduce energy bills and help ensure that the most vulnerable can afford to heat their homes.

2. Improving energy efficiency has already made a significant contribution to our energy and climate change goals. The energy saving policies and measures set out in our 2004 Energy Efficiency Action Plan[2] and the 2006 Climate Change Programme[3] are already delivering energy savings and those recently announced in the Energy White Paper[4] will continue to stimulate energy efficiency in businesses, the public sector and households.

3. Our analysis[5] suggests that there are several key barriers currently hindering greater take up of energy efficiency amongst both organisations and individuals. Issues of behaviour and motivation are significant barriers to investment in large organisations; energy saving is rarely core business. Competing priorities are often a significant barrier, particularly in the public sector where the focus is on providing high quality public services such as health care and education. For small and medium-sized enterprises (SMEs), hidden costs, such as management time, are a common barrier. For the manufacturing sector finance is an important issue while in the commercial sector, where use of energy in buildings predominates, lack of information, split incentives (e.g. between the landlord who would make the investment and the tenant who would benefit) and motivation are key barriers. For the individual, lack of information and motivation are primary barriers.

4. Improving energy efficiency will therefore require everyone – individuals, businesses and Government to take action. Individuals and businesses can play their part by reducing the waste of energy, by investing in energy efficiency measures for the home and workplace and by choosing to purchase more energy efficient buildings and products. Government will encourage and enable action by businesses and individuals by providing the right information and ensure that the regulatory framework is in place

1 DTi (2007) Meeting the Energy Challenge: A White Paper on Energy. Cm7124. www.dti.gov.uk/energy/whitepaper/page39534.html

2 Defra (2004) Energy Efficiency: The Government's Plan for Action. Cm6168. www.archive2.official-documents.co.uk/document/cm61/6168/6168.pdf

3 Defra (2006) Climate Change. The UK Programme 2006. CM6764 www.defra.gov.uk/environment/climatechange/index.htm

4 DTi (2007) Meeting the Energy Challenge: A White Paper on Energy. Cm7124. www.dti.gov.uk/energy/whitepaper/page39534.html

5 HMT(2005) The Energy Efficiency innovation Review: Summary Report. Joint HMT/Defra study. Available at: www.hm-treasury.gov.uk./media/FB4/AE/pbr05_energy_675.pdf

to incentivise action and to deliver continuing improvements to the energy efficiency of buildings and products.

5. This Action Plan sets out the package of policies and measures we have put in place to deliver improvements in energy efficiency in the UK in order to contribute to the achievement of our climate and energy policy objectives and to meet the 9% energy saving target by 2016 under the European Union's Energy End-Use Efficiency and Energy Services Directive. We expect to exceed the 9% target, delivering 272.7 TWh in savings by the end of 2016, equivalent to a saving of 18% over the target period.

6. Key elements of the Plan are:

- In the **household sector** we will continue to raise energy performance standards for new homes in England and Wales through Part L of the *Building Regulations* with the aim of delivering zero-carbon homes by 2016. The *Code for Sustainable Homes* will support this ambition and drive wider environmental improvements in new homes. To improve the energy efficiency of existing homes, we will strengthen the existing *Energy Efficiency Commitment* in the third phase of the scheme, the *Carbon Emission Reduction Target*, from 2008 to 2011 and we are committed to maintaining a *Supplier Obligation* to at least 2020. Our fuel poverty programmes in England, including *Warm Front,* and the *Decent Homes* programme are tackling the energy efficiency of the homes of the fuel poor and social housing respectively.

- To improve the energy efficiency of products in the home we are working in the EU and internationally to rapidly adopt ambitious minimum performance requirements and through the *Market Transformation Programme*, Government and Industry will work together to deliver sustainable products. Important elements of our communication campaigns illustrate the importance of energy efficiency, and promote the use of energy efficient goods and measures in the home. We will provide information on the energy efficiency of all homes sold or rented through *Energy Performance Certificates*, we will support the work of the *Energy Saving Trust* and implement a package of measures to improve metering and billing and get smart meters or visual display units into the domestic sector within the next decade.

- In the **non-household sector,** the *EU Emissions Trading Scheme* will continue to be at the heart of our efforts to drive energy efficiency which combined with the *Climate Change Levy* and *Climate Change Agreements* framework, will provide strong incentives for energy intensive industrial sectors to reduce emissions. Similar incentives will be provided for the large non-energy intensive sector by the new *Carbon Reduction Commitment* cap and trade scheme. We are also committed to the cost-effective delivery of the *Combined Heat and Power Strategy.*

- We will communicate the importance of energy efficiency to industry, commerce and the public sector, encouraging the uptake of energy efficient goods and measures through the work of the *Carbon Trust,* provision of *enhanced capital allowances,* the provision of information on the energy efficiency of commercial buildings through *Energy Performance Certificates*, and extension of *smart metering* to all but the smallest businesses within the next five years.

- In the **public sector** we will show leadership and ensure that the public sector plays an exemplary role in realising the potential for energy savings across Government. We have set new targets for *Sustainable Operations on the Government Estate* and have adopted a *Sustainable Procurement Action Plan*, to move towards a sustainably built and managed Government estate and wider public sector. We have also provided funding to establish *revolving loan funds* to finance energy efficiency work in the public sector.

- For the *National Health Service*, in England and Wales we have set, and are making good progress towards targets to reduce the amount of primary energy consumed by 15% by 2010. We have also adopted a *Sustainable Schools Action Plan* for England, to ensure that schools have all the support they need to become models of sustainable development and will use the *Building Schools for the Future* programme to ensure all new schools are built to high energy efficiency standards. We will also work with *Local Authorities and Regional Government* to improve energy efficiency.

- In the **transport sector** we will continue to press for aviation to be included in the *EU Emissions Trading Scheme* and investigate the possible inclusion of surface transport. To incentivise the purchase of energy efficient vehicles we have raised *vehicle excise duty* on inefficient vehicles and reformed *company car tax.* We will also work within the EU to raise *fuel efficiency standards* for new cars and vans and continue to fund innovation in the low carbon transport industry through *the Energy Technologies Institute* and will finance a new *Low Carbon Vehicle Innovation Platform*. We will also use *public procurement* to deliver environmental and value for money benefits and promote competition amongst manufacturers to deliver carbon vehicles.

- To communicate the importance of energy efficient travel choices we are investing heavily in *public transport* and have put in place a substantial programme to promote changes towards more sustainable patterns of travel behaviour through Smarter Choices. We have also launched a consumer facing communications strategy reinforcing the colour coded *vehicle efficiency labels.*

- We will work with the Devolved Administrations (DAs) where policies apply in different countries within the UK.

- We will work in the **EU and international fora** to promote rapid implementation of the *EU Energy Efficiency Action Plan,* with the target of saving 20% of the EU's primary energy consumption by 2020. We will actively support the development of an *international framework agreement for energy efficiency*. With the G8 group of nations, we will take forward our commitments in the *Gleneagles Plan of Action*, and the priorities agreed in St. Petersburg in 2006 and Heiligendamm in 2007. We will also continue to help build regulatory and investment capacity for energy efficiency internationally through our support of the *Renewable Energy and Energy Efficiency Partnership* and encourage co-operation and collaboration on the development of energy efficiency policies and technologies.

1. Climate change is one the greatest challenges facing the world. It will affect the basic elements of life for people around the world – access to water, food production, health and the environment. The Stern Review of the Economics of Climate Change[6] estimated that if we don't act now, the overall costs and risks of climate change will be equivalent to losing a least 5% of global GDP, and if a wider range of risks and impacts is taken into account, estimates of damage could rise to 20% of GDP or more. In contrast the costs of early action to reduce emissions can be limited to around 1% of global GDP each year.

2. We therefore need to take prompt and strong action if we are to avoid the more damaging effects of climate change highlighted in the Stern Review. Because climate change is a global problem, the response to it must be international, based on a shared vision of long-term goals and agreement on frameworks that will accelerate action over the next decade. However, the framework needs to build reinforcing approaches not only at the international level but also regional and national levels.

3. It is imperative that industrial countries like the UK make a serious commitment to achieving the emission reductions. In addition to our existing international commitments, we have proposed placing in statute (through the Climate Change Bill) a target to reduce the UK's contribution to global CO_2 emissions by 60% by 2050 compared to 1990 emissions levels, with a duty to ensure the trajectory to 2050 is consistent with a reduction in CO_2 emissions by 26-32% by 2020. We believe this is achievable at acceptable cost with the right policies and actions. As the Stern Review made clear we know that the practical solutions and technologies exist to cut emissions but we need strong deliberate policy action to motivate their take-up.

4. Of these practical actions, improving energy efficiency is the fastest and most cost-effective means of saving energy and reducing emissions. And we know that energy efficiency has already made a substantial difference. The International Energy Agency has estimated that global energy demand would be 50% higher today without the energy savings achieved through energy efficiency since 1973. In the UK we estimate that over half the savings in our Climate Change Programme are derived from energy efficiency policy.

5. As the 2007 Energy White Paper, Meeting the Energy Challenge, makes clear, improving energy efficiency can also contribute to achieving our other energy policy goals as well as delivering carbon reductions:

   - ensuring security of supply – reducing energy demand will reduce our dependence on imported energy supplies and help improve the resilience of distribution networks;
   - maintaining competitiveness – by reducing energy bills, energy efficiency can boost profits and improve the competitiveness of UK business and the development of energy efficient technologies will provide export opportunities in an increasingly carbon-constrained world; and
   - tackling fuel poverty – improving the energy performance of homes through the installation of energy saving measures can reduce fuel bills and help take households out of fuel poverty.

[6] www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/sternreview_index.cfm

6. Since the publication of the last UK Energy Efficiency Action Plan in 2004 we have made significant progress in delivering real improvements in energy efficiency. We have significantly raised energy efficiency standards in Building Regulations and announced our intention to go further, towards zero-carbon homes within the next decade. Through the Energy Efficiency Commitment over ten million households have already benefited from energy-saving measures and we are requiring energy suppliers to meet even higher targets in future. In the business sector, the Climate Change Agreements now cover over 6,000 companies, covering over 14,000 sites in 54 sectors, and have successfully delivered substantial carbon savings in their first five years.

7. Despite this progress there is still significant and cost-effective energy-saving potential to be realised and most energy-use remains inefficient when compared with what is technically possibly and cost-effective. The Carbon Trust estimates that currently businesses in the UK waste on average 10-20% of the energy they buy, equivalent to £1 billion a year, through poor control of heating, air conditioning and ventilation and through leaving lights and appliances on when not in use. We estimate that by 2020 businesses could save around 25 MtC through cost-effective energy-saving measures. In the household sector the Energy Saving Trust estimates that around £1bn worth of electricity is wasted by leaving appliances on standby. This equates to around 10TWh, or about 10% of the electricity consumption of the household sector.

8. However, as the Stern Review identified, there are still obstacles and market failures preventing us realising the full technical and economic potential for energy efficiency. These barriers include:

   - the lack of appreciation of, and information about, the true costs and benefits of energy efficiency measures;
   - lack of access to capital and high costs of capital; and
   - split incentives, and lack of motivation, awareness or interest among consumers.

   If we do not take action to address these barriers then anticipated economic growth will increase energy demand and the progress and savings we have achieved to date will be negated.

9. It is therefore vital that we have a strong and effective policy framework to ensure that we continue to deliver significant energy savings over the period to 2020 and beyond. We can improve energy efficiency in two ways: through technological improvements, for example improvements in the fabric of buildings where a new house built to today's standards is 40% more efficient than one built before 2002, or by changing our behaviour to reduce the amount of energy we waste, for example by leaving appliances on when not in use.

10. Individuals, businesses and Government will all need to play their part in reducing energy waste, by investing in energy efficiency measures for the home and workplace and by choosing to purchase more energy efficient buildings and products.

11. Government must also ensure that the right policy framework is in place to support technological innovation and to create the conditions for individuals and organisations to take action. No single policy measure can deliver the savings we need. If we are to achieve our energy efficiency and carbon saving objectives we need to use all the policy levers at our disposal across the economy alongside work with our partners in the EU and internationally. This Action Plan therefore sets out a comprehensive package of policies and measures to improve energy efficiency in the UK.

Table 1: Key levers to reduce energy consumption in the UK

Sectors	**Lower energy consumption**	
	Increase technical energy effciency	**Behaviour: reducing service demand and avoiding waste**
Households	Building Regulations, Code for Sustainable Homes, Market Transformation Programme and Product Standards, Energy Efficiency Commitment, Carbon Emissions Reduction Target	Energy Saving Trust programmes, billing and metering, Energy Performance Certificates, Labelling, "Act on CO_2" communication campaign
Business and Public	EU Emissions Trading Scheme, Climate Change Agreements, Carbon Reduction Commitment, Enhanced Capital Allowances, Building Regulations, Market Transformation Programme and Product Standards, Revolving Funds, public procurement standards	EU Emissions Trading Scheme, Climate Change Levy and Climate Change Agreements, Carbon Trust programmes, billing and metering, Energy Performance Certificates, labelling
Transport	Voluntary Agreement with motor manufacturers and successor	Vehicle Excise Duty, inter-modal shifts, eco-driving campaigns, vehicle labelling, reducing need to travel

Purpose of the Plan

12. This Action Plan is intended to fulfil two Government commitments:

- to meet the requirement in Article 14 of the EU Energy End-Use Efficiency and Energy Services Directive to produce a National Energy Efficiency Action Plan for submission to the European Commission; and

- to review and update the Government's 2004 Energy Efficiency Action Plan reflecting policy developments arising from the 2006 Climate Change Programme[7], the 2006 Energy Policy Review[8] and the 2007 Energy White Paper in order to provide a comprehensive statement of UK energy efficiency policy.

[7] www.defra.gov.uk/environment/climatechange/uk/ukccp/index.htm

[8] DTI (2006) The Energy Challenge: Energy Review Report 2006. Cm6887

The Energy End-Use Efficiency and Energy Services Directive

13. The Energy End-Use Efficiency and Energy Services Directive was adopted in May 2006. The Directive aims to enhance the cost-effective improvement of energy end-use efficiency in EU Member States and has a number of key provisions including the establishment of a national indicative energy saving targets of 9% by the end of 2016, a requirement for the public sector to fulfil an exemplary role, a requirement for Member States to place obligations on energy suppliers and distributors to promote energy efficiency and requirements relating to metering and billing to allow consumers to make better informed decisions about their energy use. The provisions of the Directive must be implemented by Member states by May 2008.

14. This Action Plan is intended to fulfil the requirement in Article 14 of the Directive for all Member States to produce a National Energy Efficiency Action Plan setting out the policies and measures put in place to reach the energy saving target in Article 4 of the Directive (see Chapter 2).

The 2004 Energy Efficiency Action Plan

15. The Government adopted an Energy Efficiency Action Plan[9] in 2004 which set out how we intended to deliver the commitments relating to energy efficiency that were made in the 2003 Energy White Paper[10]. We undertook to review the delivery of the policies and policies and measures in the Action Plan in 2006 and this was undertaken in the Climate Change Programme and Energy Policy Review. These reviews, and the subsequent Energy White Paper, Meeting the Energy Challenge, published in May 2007, have significantly strengthened the package of measures to promote energy efficiency in the UK. This Action Plan is therefore intended to update the 2004 Action Plan and provide a comprehensive overview of action planned and underway in all sectors of the economy in the UK to deliver improvements in energy efficiency.

Geographic Coverage of The Plan

16. The energy-saving target in the Energy End-Use Efficiency and Energy Services Directive applies to the UK as a whole and as such this Action Plan has been drawn up in consultation with the devolved administrations, and where policies do not apply UK-wide or where different policies apply in different countries within the UK, this has been made clear.

Monitoring Delivery

17. The delivery of the polices and measures set out in this plan will be reported on annually in the report to Parliament, required under the Climate Change and Sustainable Energy Act 2006.

18. Further Action Plans must be submitted to the European Commission in 2011 and 2014 which will include an analysis and evaluation of measures set out in preceding Action Plans and progress towards meeting the energy saving target.

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[9] www.archive2.official-documents.co.uk/document/cm61/6168/6168.pdf

[10] DTI 2003 Our Energy Future: Creating a Low Carbon Economy. Cm5761

19. Under Article 4 of the Energy End-Use Efficiency and Energy Services Directive the United Kingdom has adopted and aims to achieve an overall national indicative energy savings target of 9% over the period 2008 to the end of 2016.

20. The target is expressed in absolute terms in TWh or equivalent and the Directive sets out a methodology which must be used to establish the target.

21. The target consists of 9 % of the annual average amount of annual final inland energy consumption of all energy users within the scope of this Directive based on the most recent five-year period prior to the implementation of the Directive.

22. The Directive allows energy savings that result from energy efficiency improvement measures initiated in a previous year, not earlier than 1995, and that have a lasting effect to be taken into account in the calculation of the annual energy savings. However, we have determined that in the UK we will only take into consideration measures since the adoption of the UK Climate Change Programme in 2000.

23. The table below sets out the calculation of the national energy saving target for the United Kingdom which is 136.5 TWh by the end of 2016.

Table 2: Calculation of the national saving target (TWh)

	2001			2002			2003			2004			2005		
	Elec.	**Other**	**Total**	**Elec.**	**Other**	**Total**	**Elec.**	**Other**	**Total**	**Elec.**	**Other**	**Total**	**Elec.**	**Other**	**Total**
Final inland energy consumption [1]	320	1391	1711	321	1341	1662	319	1339	1657	321	1344	1665	327	1326	1654
energy consumption of EU-ETS installations [2]	0	160	160	0	151	151	0	143	143	0	141	141	0	142	142
energy consumption of armed forces [3]	2	3	5	2	3	5	2	3	5	2	3	5	2	3	5
Total energy consumption of exemptions	2	163	165	2	154	156	2	146	148	2	144	146	2	145	147
Final inland energy consumption in scope of ESD	318	1228	1546	319	1187	1506	317	1192	1509	319	1200	1519	325	1181	1506
Of which: Households			560			553			560			565			546
Tertiary sector			229			204			205			211			211
Industry (ESD scope)			259			244			233			228			230
Transport			497			505			510			515			519
												Average over 5 year period			1517
												9% energy saving target [4]			136.5

Notes:

[1] Final consumption data is taken from the Digest of UK Energy Statistics (DUKES), i.e. it is based on official national statistics. 2005 data is the most recent available and so the 5-year average is taken as the average from 2001 to 2005 inclusive.

[2] EU-ETS coverage is derived from participants' reports under Phase 1 of the ET Directive in 2005 and is at the installation rather than company level. The proportional coverage of the industry sector and public sector is then assumed constant for years 2001-2004.

[3] Military applications comprise energy consumption by the army, air force and navy only.

[4] The target, and energy savings that contribute to meeting this target, are measured on a delivered energy basis

Interaction with the EU-Emissions Trading Scheme

24. Energy use covered by the EU-Emissions Trading Scheme and national armed forces is outside the scope of the Energy End-Use Efficiency and Energy Services Directive and therefore is not included in the calculation of the target; equally action to improve energy efficiency in installations covered by the EU Emissions Trading Scheme will not count towards achievement of the target.

25. Nevertheless, in order to provide a comprehensive picture of action to improve energy efficiency this Action Plan includes details of policies and measures in this sector.

Interim Target

26. The Directive also requires Member States to set an indicative energy savings target for the third year of application of the Directive (by the end of 2010).

27. The interim target for the UK will be 136.5 TWh, equivalent to the 9% target for the entire target period to 2016.

Achieving the Target

28. The table below summarises the key policies and measures that will deliver the savings necessary to meet the target. Further information on the methods used to measure savings from past measures and the expected methods to be used to measure savings from current and future measures are set out in Annex A. The table shows that the UK expect to exceed the 9% target, delivering 272.7 TWh in savings by the end of 2016, equivalent to a saving of 18% over the target period.

Table 3: Energy Savings associated with UK energy efficiency policies and measures

Energy efficiency improvement programmes, energy services, and other measures to improve energy efficiency planned for achieving the target	Annual energy savings expected by end of **2010**		Annual energy savings expected by end of **2016**		Annual energy savings expected by end of **2020**	
Measures in the Household Sector:	**TWh**	**MtC**	**TWh**	**MtC**	**TWh**	**MtC**
Energy Efficiency Commitment Phase 1 (EEC1)	3.1	0.3	3.1	0.3	3.1	0.3
Energy Efficiency Commitment Phase 2 (EEC2)	7.8	0.5	7.8	0.5	7.8	0.5
Carbon Emission Reduction Commitment (CERT)	14.2	1.0	15.5	1.1	15.5	1.1
Supplier Obligation	0.0	0.0	31.2	2.2	50.2	3.5
Northern Ireland Energy Efficiency Levy	0.4	0.0	0.4	0.0	0.4	0.0
Fuel Poverty Schemes	2.7	0.4	2.8	0.4	2.8	0.4
Energy Performance of Buildings Directive (EPBD)	3.5	0.2	7.6	0.4	10.1	0.6
Building Regulations England & Wales 2002	11.4	0.6	12.5	0.7	12.5	0.7
Building Regulations E&W 2005/6	13.2	0.7	33.8	1.8	49.4	2.6
Building Regulations Scotland 2007	1.8	0.1	4.7	0.2	6.8	0.4
Building a Greener Future	0.0	0.0	4.2	0.2	22.6	1.2
Billing and Metering	2.6	0.2	5.8	0.4	5.8	0.4
Product Policy	6.6	0.6	11.2	1.0	14.2	1.3
Package of Measures	1.4	0.1	1.5	0.1	1.5	0.1
Measures in the Private and Public Sectors:	**TWh**	**MtC**	**TWh**	**MtC**	**TWh**	**MtC**
Building Regulations E&W 2002	5.9	0.4	6.5	0.4	6.5	0.4
Building Regulations E&W 2005/6	3.2	0.2	12.0	0.7	19.0	1.2
Building Regulations Scotland 2007	0.5	0.0	1.9	0.1	3.1	0.2
Carbon Reduction Commitment (CRC)	1.1	0.1	6.3	0.6	11.8	1.1
Product Policy	2.2	0.2	8.1	0.7	12.1	1.1
Energy Performance of Buildings Directive	0.0	0.0	4.8	0.4	8.1	0.6
UK Emissions Trading Scheme (UKETS)	3.5	0.3	3.5	0.3	3.5	0.3
Carbon Trust programmes	14.6	1.1	14.6	1.1	14.6	1.1
Private sector specific:						
Climate Change Agreements (CCAs) excl EUETS	3.9	0.3	3.9	0.3	3.9	0.3
Smart metering	1.3	0.1	2.1	0.2	2.7	0.2
Carbon Trust SME fund	1.2	0.1	1.3	0.1	1.3	0.1
SME measures	1.2	0.1	1.2	0.1	1.2	0.1
Public sector specific:						
Devolved Administrations	3.7	0.3	4.1	0.3	4.1	0.3
Revolving Loan Fund	1.1	0.1	1.2	0.1	1.2	0.1
Measures in the Transport sector:	**TWh**	**MtC**	**TWh**	**MtC**	**TWh**	**MtC**
Voluntary Agreement Package	34.1	2.3	45.5	3.2	48.0	3.5
Future Agreements	1.0	0.1	10.6	0.7	25.7	1.8
Local Authorities Policies	2.7	0.2	3.0	0.2	3.0	0.2
Total Energy and Carbon Savings	**149.9**	**10.6**	**272.7**	**18.8**	**372.5**	**25.7**

29. Chapter 3 – Delivering the Energy Savings – sets out in more detail, on a sectoral basis, the policies and measures the Government has put in place to meet the target.

30. This chapter sets out, by sector, the policies and measures currently in place in the UK to improve energy efficiency.

The Household Sector

Summary of measures

To improve the energy efficiency of new homes, we:

- have introduced revisions to Building Regulations (England and Wales), improving energy efficiency standards so a new home built in 2007 is 40% more energy efficient than one built in 2002;
- have put in place measures to ensure compliance with these new standards;
- have introduced revised energy standards in Scottish Building Regulations so a new home is at least 40% more energy efficient than one built in 2002, which together with new planning guidance for on-site low and zero-carbon equipment will reduce CO2 emissions for many developments by at least 55%;
- have introduced, in England, a Code for Sustainable Homes to drive a step change in the building of new sustainable homes – with a 'star rating' for new homes depending on their efficiency – ensuring that all homes funded by Government built by registered social landlords comply with a 3 star rating;
- propose to make all homes in England zero carbon by 2016, with interim targets between then and now, with potential carbon savings of between 1.1 and 1.2 MtC per year by 2020;
- have introduced a requirement, in Wales, that all new buildings, including housing, funded or built on land disposed of by the Assembly Government meet the Ecohomes Excellent environmental standard;
- have, in Wales, set an aspirational target that all new buildings will be zero-carbon from 2011;
- will further reduce the energy footprint of all new homes in Scotland;
- will lead the way in low-carbon developments, identifying innovation gaps, accelerating technology which has not yet reached the market and assessing the impact of low-carbon heat and power generation; and
- will continue to promote and encourage the use of low or zero-carbon micro-generation technologies.

To improve the energy efficiency of existing homes, we:

- will continue to strengthen the Energy Efficiency Commitment, with the third phase of the scheme from 2008-2011, to be known as the Carbon Emissions Reduction Target, potentially saving 1.1 MtC per annum by 2010;

Summary of measures (continued)

- will drive further energy efficiency improvements in the home through a continued obligation on energy suppliers until at least 2020;
- have set minimum requirements for efficient heating and thermal comfort for social landlords using the Decent Homes Standard, and other mechanisms in the devolved administrations;
- are continuing to improve energy efficiency of the homes of vulnerable groups by tackling fuel poverty, through the Decent Homes Standard in social housing, and Warm Front and other programmes elsewhere; and
- have introduced various financial measures to incentivise energy efficiency, including a reduction on VAT for professionally installed energy saving materials and the Landlord's Energy Saving Allowance.

To improve the energy efficiency of products in the home and workplace we:

- are working in the EU to rapidly adopt ambitious minimum performance requirements for 21 priority products, and also by promoting international co-operation on standards and labelling;
- will use the Market Transformation Programme to help Government and industry work together to deliver sustainable products;
- are working with manufacturers and retailers of lightbulbs to phase out inefficient light bulbs for domestic use by 2011, saving up to 1.2 MtC by 2020 and around £30 on the average domestic electricity bill; and
- will set high efficiency standards in Government procurement to achieve value for money, improve Government's own energy efficiency and develop the market for more efficient goods.

To communicate the importance of energy efficiency, and encourage the uptake of energy efficient goods and measures in the home we:

- have launched a cross-Government multi-media communication and marketing campaign to raise awareness of the contribution individuals make to CO_2 emissions, and the simple ways in which they can act to help tackle climate change. The campaign carries simple call-to-action branding: *Act on CO_2*, and is part of Defra's wider Climate Change Communications Initiative;
- will provide information on the energy efficiency of homes sold or rented through Energy Performance Certificates, indicating how to improve energy efficiency;
- will seek to create a market for "green" financial products designed to help householders invest in energy efficiency measures and microgeneration;

Summary of measures (continued)

- will continue to support the vital work of the Energy Saving Trust as they promote energy efficiency across the household sector in the UK though advertising programmes, advice centres and the endorsement of energy efficient products; and
- will roll forward a package of measures to get smart meters or visual display units into the household sector in the next decade, and provide more detailed information on customers' bills, so householders have a greater understanding of their energy use.

Summary of energy savings

Policy	Expected energy and carbon savings in 2010		Expected energy and carbon savings in 2016		Expected energy and carbon savings in 2020	
	TWh	MtC	TWh	MtC	TWh	MtC
Energy Efficiency Commitment Phase 1 (EEC1)	3.1	0.3	3.1	0.3	3.1	0.3
Energy Efficiency Commitment Phase 2 (EEC2)	7.8	0.5	7.8	0.5	7.8	0.5
Carbon Emission Reduction Commitment (CERT)	14.2	1.0	15.5	1.1	15.5	1.1
Supplier Obligation	0.0	0.0	31.2	2.2	50.2	3.5
Northern Ireland Energy Efficiency Levy	0.4	0.0	0.4	0.0	0.4	0.0
Fuel Poverty Schemes	2.7	0.4	2.8	0.4	2.8	0.4
Energy Performance of Buildings Directive (EPBD) (1)	3.5	0.2	7.6	0.4	10.1	0.6
Building Regulations England & Wales 2002	11.4	0.6	12.5	0.7	12.5	0.7
Building Regulations E&W 2005/6	13.2	0.7	33.8	1.8	49.4	2.6
Building Regulations Scotland 2007	1.8	0.1	4.7	0.2	6.8	0.4
Building a Greener Future – Toward szero-carbon homes	0.0	0.0	4.2	0.2	22.6	1.2
Billing and Metering	2.6	0.2	5.8	0.4	5.8	0.4
Product Policy	6.6	0.6	11.2	1.0	14.2	1.3
Package of Measures, (2)	1.4	0.1	1.5	0.1	1.5	0.1
TOTAL HOUSEHOLD SECTOR	**68.7**	**4.7**	**142.1**	**9.3**	**202.7**	**13.1**

Notes:

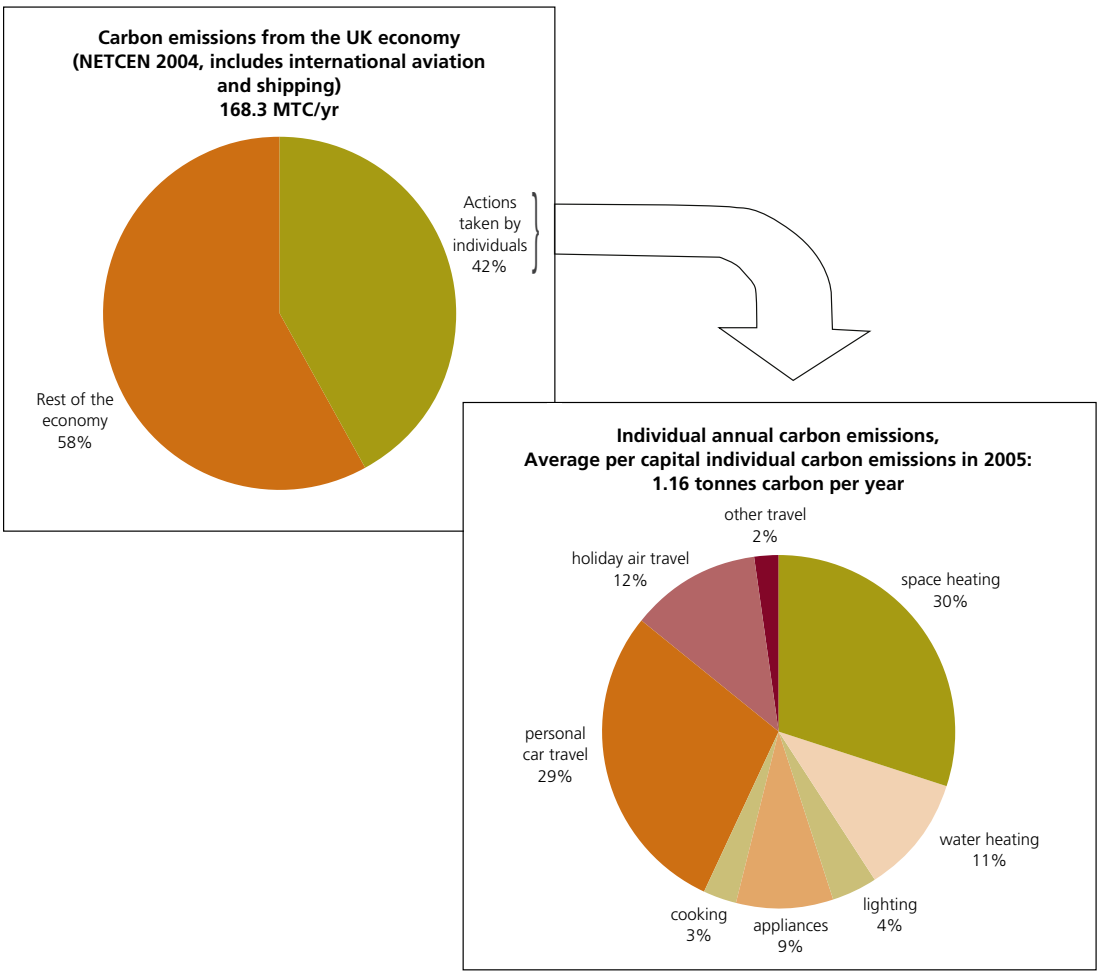
(1) EPBD savings in the Energy White Paper (EWP) do not include 0.2MtC/y in the Household sector for 2010 and subsequent years which arise from advice on heating systems, including early replacement of inefficient boilers. These savings had already been identified in the Climate Change Programme 2006 and included in the EWP baseline. The full savings are included here.

(2) Package of Measures includes the Green Landlord Scheme, improved enforcement of Building Regulations, reduced VAT for wood fuelled plants and the Low Carbon Building Programme.

(3) Annex A gives further information on the methods used to estimate likely energy and emissions savings, the methods used to measure savings from past measures, e.g. EEC1, and the expected methods to be used to measure savings from current and future measures.

31. Some 40% of the UK's total carbon emissions are directly attributable to decisions made by citizens. Of energy used in the home, about 75% is for provision of space heating and hot water with the remainder used for cooking, appliances and lighting.

Figure 1: Carbon dioxide emissions from the UK economy (MtC)



32. Demand for energy services in the household sector is expected to grow by an average of 2.5% per annum over this decade, equivalent to 0.85 MtC per year. Historically this increase was partly offset by improvements in energy efficiency of 1% per annum (due to improvements in building standards amongst other things) giving a smaller net increase in energy consumption. We expect energy efficiency improvements to fully offset growth in energy demand from about 2010 as existing policies take full effect. To be consistent with the trajectory to our 2020 and 2050 objectives, we would need to see demand for grid-based energy falling at around 1.8% per year.

33. We estimate that there is potential to reduce emissions from households by around a quarter, using established technologies available today. Despite the cost savings they could make by improving the energy efficiency of their homes and avoiding energy waste, consumers are often unwilling or unable to do so. As set out above (para 8), there are a number of well understood market failures and other barriers which explain this. Government needs to respond to these market failures and barriers if the potential savings are to be realised.

34. There are two reasons why the UK's climate change programme includes a diverse range of policy interventions targeting this sector:

- there are a large number of different actors who make decisions about different elements of household energy usage. Consumers choose the products and appliances that they install in their homes and how they are used, while appliance manufacturers and retailers decide the energy standards of appliances and how they are sold, while it is developers and builders who design and construct new dwellings. Al respond to differing signals and incentives; and
- different types of policy interventions are required to tackle the varying barriers, from regulatory approaches such as product and building standards to information, awareness raising and encouragement, to support programmes including subsidies or fiscal incentives, where appropriate.

Table 4: Different policies are needed to tackle the barriers to energy efficiency.

Instrument	What problem does it tackle?	Examples
Regulation	Hidden costs, irrational consumer behaviour, market failures, split incentives	Building and product standards
Grants and fiscal incentives	Hidden costs, savings not material, inertia and lack of consumer interest, split incentives – landlord/ tenant	Warm Front, EEC subsidies, Reduced VAT, Low Carbon Buildings Programme
Information and awareness raising	Lack of awareness or wrong information about costs and benefits of energy efficiency	Energy Saving Trust activities, Product labelling, Energy Performance certificates, Real-Time Displays, CO_2 Calculator, 'Act on CO_2' campaign, Climate Challenge Fund projects
Voluntary agreements	Slow implementation of regulation	Appliance manufacturers and retailers
Public sector leadership	Public need for leadership and sense that Government takes issue seriously	Public sector carbon and energy efficiency targets
R&D – innovation	Need for new products – new applications or improved efficiency.	Development of LED lighting, vacuum panel refrigeration, solid wall insulation etc.

35. In summary, energy efficiency is a complex area that requires the deployment of a range of instruments to tackle household emissions and deliver the savings we need from this sector. The challenge comes down to how we can successfully mobilise millions of individuals, households and organizations to change their behaviour and make more energy efficient choices and purchasing decisions.

Energy Efficiency Targets in the Household Sector

36. The Sustainable Energy Act 2003 required the Government to publish a statutory aim for residential energy efficiency in England. This requirement was fulfilled in the 2004 Energy Efficiency Action Plan, which set out an aim to save 3.5 million tonnes of carbon per year by 2010 through energy efficiency measures in the residential sector in England.

37. The ambition-level of the aim was determined during development of the 2004 Action Plan, and is based on the data and evidence available at that time. The Government therefore intends to revisit the aim later this year to test it against the latest evidence base, which has been augmented significantly since 2004, including through experience from the second phase of the Energy Efficiency Commitment.

38. A further target was set in the Housing Act 2004, which requires the Secretary of State to take reasonable steps to improve residential energy efficiency in England by at least 20 per cent by 2010 from a year 2000 baseline.

39. Although the two targets use different metrics, they reflect a similar outcome in terms of the required improvement to the energy performance standards of housing.

Towards Zero-Carbon Homes

Building Regulations

40. Carbon emissions from buildings account for 45% of total emissions, with housing making up 27%. So improvements in the energy efficiency of our homes will make a significant impact on our carbon reduction goals. Minimum energy efficiency standards for new housing in England and Wales are contained in Part L of the Building Regulations.[11] Revisions to the Regulations in 2002, 2005 (covering new boilers and windows) and 2006 have significantly improved the energy performance standards of new houses, so that a house built today will be 40% more efficient than one built before 2002.

41. Around 30% of the houses that will be standing in 2050 are yet to be built, representing about nine million new homes. It is vital that these homes are built to the highest possible energy efficiency standards. We propose to do this by progressive tightening of Building Regulations, accompanied by guidance, improved regulatory compliance, promotion of best practice and research into the buildings of the future.

42. In the consultation 'Building a Greener Future: Towards Zero Carbon Development'[12] we have proposed that, by 2016, all new homes built in England should be zero carbon. This means that, over a year, the net carbon emissions from all energy use in the home would be zero. We propose to achieve this by improving the energy performance of homes and increasing the use of renewable and low carbon sources of energy, either installed in the individual home or supplied to the entire development.

43. The consultation document proposed interim steps; by 2010, all new homes would have a 25% improvement in energy performance compared to current building regulations and, by 2013, a 44% improvement. These improvements are based on the energy efficiency standards set out in the Code for Sustainable Homes. Our initial estimates are that that measures to deliver zero carbon homes could reduce emissions by between 1.1 and 1.2 million tonnes of carbon (MtC) per year by 2020 and between 6.5 – 7 MtC per annum by 2050. These step changes would be set out in progressive changes to future Building Regulations and we are proposing to consult on the next set of changes to Part L of the Regulations in 2008.

[11] www.planningportal.gov.uk/england/professionals/en/1115314231792.html

[12] http://www.communities.gov.uk/index.asp?id=1505157

44. Government recognises that if we are to realise the full potential of the improved building standards we continue to put in place we need to ensure effective compliance with those standards.

45. Therefore, we have put in place a comprehensive package of measures to improve compliance. We have:

- introduced mandatory pressure testing and commissioning for new buildings;
- simplified the approach to demonstrating compliance including extended self-certification schemes to reduce burdens on local authorities;
- launched the largest ever training programme for new Building Regulations;
- taken powers in the Climate Change and Sustainable Energy Act 2006 to extend the time period for local authorities to prosecute breaches of energy efficiency standards;
- used the CCSE to mandate a report to Parliament on compliance with Part L standards, to ensure they are given proper scrutiny; and
- worked with the industry to develop 7 Building Control Performance Indicators, of which ensuring compliance is one. These will give building control bodies a framework to monitor and improve their performance in key areas, such as ensuring compliance.

46. We have started to investigate how the new requirements in the 2006 Part L amendment are bedding down. In late 2006 the first of a series of workshops were held with building control officers and Approved Inspectors to discuss their experience of the impact of the changes to Part L, and what further dissemination measures could be beneficial.

47. We will be carrying out a survey of implementation in 2008 when a reasonable sample of buildings has been built to the new standards. This will inform the further amendments the Government has signaled it proposes to make. A progress report on measures to improve compliance was published in February 2007.

48. To support the move to zero-carbon homes, the Government announced in the 2007 Budget that from 1 October 2007 all new homes meeting the zero carbon standard costing up to £500,000 will pay no stamp duty, and zero-carbon homes costing in excess of £500,000 will receive a reduction in their stamp duty bill of £15,000.

49. The draft Planning Policy Statement (PPS): *Planning and Climate Change*[13] was published for consultation at the end of 2006. The draft PPS sets out for England how planning, in providing for the new homes, jobs and infrastructure needed by communities, should help shape places with lower carbon emissions and resilient to the climate change now accepted as inevitable. The PPS expects new development to be located to optimise its carbon performance and make the most of existing and planned opportunities for decentralised, renewable and low-carbon energy supplies. The final PPS will be published later in 2007.

[13] http://www.communities.gov.uk/index.asp?id=1505140

50. In Scotland Section 179 of the Housing (Scotland) Act 2006 requires Scottish Ministers to prepare and publish a strategy for improving the energy efficiency of living accommodation and later to review and report on its implementation. This legislation came into force on 28 May 2007.

51. Revised Scottish Building Regulations also came into force in May 2007 requiring new buildings to meet a target level of carbon dioxide emissions and requiring the building design to be considered holistically in terms of energy. The new standards will be the most demanding requirements for the thermal and insulation of new buildings, extensions and conservatories in the UK. These energy standards will encourage the incorporation of low and zero carbon technologies, including microgeneration. 2007 revisions to the energy standards will deliver further carbon dioxide savings in the region of 18-25% when compared to current standards which have been in place since 2002. Taken together, the improvements in standards should deliver savings of around 40% compared to 2002. Details of further measures to reduce the energy footprint of buildings are yet to be decided by Scottish Ministers but will be announced in due course.

52. In March 2007 the Scottish Executive published Scottish Planning Policy 6 *Renewable Energy* making it clear that new developments with a total cumulative floorspace of 500 sq metres or more should incorporate on-site zero and low carbon equipment contributing at least an extra 15% reduction in CO_2 emissions beyond the 2007 Scottish building regulations carbon dioxide emissions standard. The development plan process should be used to consider whether local circumstances justify going beyond 15%, below the 500 sq metres threshold and secured for particular developments. Taken together with the changes to building regulations, this could reduce CO_2 emissions by up to 51% compared to 2002.

53. In Northern Ireland, the Department of Finance and Personnel (DFP) has through the revision and development of the new Building Regulations, identified energy efficiency as a major issue to be addressed in construction of new homes. Energy efficiency standards for new homes are set by Part F of the Building Regulations (Northern Ireland) 2006. These new standards set a target Carbon Dioxide Emissions Rate which is specific to each individual new dwelling and which may not be exceeded. The 2006 standards improve the energy efficiency of new homes by around 40% over the previous 1998 standards with a corresponding 40% reduction in carbon dioxide emissions.

54. The new 2006 Part F requirements represent a major improvement in energy efficiency standards, as for the first time they bring Northern Ireland broadly into line with England and Wales on a similar time scale. The standards are designed to encourage a move to the use of low or zero carbon energy sources.

55. To support and smooth the introduction of the new regulations a series of awareness seminars were run by the responsible Department. These seminars toured Northern Ireland to make them readily accessible to members of the Northern Ireland construction industry and a record attendance ensued.

56. As part of the new Part F package we have put in place a series of measures to improve compliance by introducing e.g. mandatory air tightness testing and commissioning of building services.

57. Feedback from users indicated concerns about the practicability of air tightness testing of dwellings and the availability of air tightness testing services. We responded to this by running a series of air tightness testing demonstrations for the Northern Ireland Construction Industry to alleviate those concerns. This gave a positive outcome to the new mandatory requirement for air tightness testing.

Code for Sustainable Homes

58. Building Regulations set out minimum performance standards for new homes. But we want to encourage housebuilders and developers to go beyond compliance with minimum requirements. Building on the recommendations of the Sustainable Buildings Task Group, the Code for Sustainable Homes[14] has been developed to support a step change in the building of sustainable new homes. The Code provides a single national standard to guide industry in the design and construction of sustainable homes, considering not just energy but also water, materials, waste and ecology. Developers will be able to obtain a 'star rating' for any new home which will demonstrate its environmental performance. It will provide valuable information to home buyers, and offer builders a tool with which to differentiate themselves in sustainability terms. It is a means of driving continuous improvement, greater innovation and exemplary achievement in home building. The Code provides a clear picture of what will be required to meet future Building Regulations.

59. There are six levels of the Code, with mandatory minimum standards for energy efficiency and water efficiency at each level. For example, Code Level 1 represents a 10% improvement in energy efficiency over the 2006 Building Regulations. Code Level 6 would be a completely zero carbon home (heating, lighting, hot water, and all appliances).

60. Improvements in the energy efficiency of new homes of more than 25% compared to 2006 regulations (Level 3 of the code) would probably require some form of low or zero carbon energy generation, either by individual buildings (e.g. dedicated solar water heating) or, by whole developments sharing a source of low carbon generation (e.g. wind turbines). Development beyond level 3 of the code will not only improve energy efficiency but encourage the deployment of low carbon technologies and encourage greater distributed forms of energy generation.

61. While the Code is voluntary for private sector housing, Government is considering whether, from April 2008, all new homes should be required to have a rating against the Code. We will consult on specific proposals by the end of 2007.

62. The Government will use the Code to support housing developments which are under our own control. For example, it will ensure that all new Government funding for homes built by registered social landlords and other developers will now make it a condition that they comply with level 3 of the Code for Sustainable Homes.

[14] www.planningportal.gov.uk/uploads/code_for_sust_homes.pdf

63. In Scotland, the Scottish Building Standards Agency has worked to embed sustainability measures in building regulations and planning guidance. Guidance on the building regulations already incorporate measures that are included as options in the Code, on the sustainable drying of washing and, adopting a Lifetime Homes approach, on liveability and adaptability. Further changes to promote sustainable development are yet to be decided by Scottish Ministers and will be announced in due course.

64. In Northern Ireland, the Department for Social Development now require that EcoHomes standard of "Very Good" shall be mandatory for all new build social housing projects from April 2007. EcoHomes "Very Good" standard is deemed to satisfy level 3 of the Code for Sustainable Homes until April 2008 at which time full compliance with the prescribed minimum of level 3 of the Code will be mandatory.

65. As part of its overall approach to planning and climate change, the Welsh Assembly Government will be considering whether there is a role in Wales for the Code for Sustainable Homes. In the meantime all housing funded by or built on land disposed of by the Assembly Government will meet the EcoHomes (BREEAM) 'Excellent' standard.

66. In keeping with its climate change agenda, the Welsh Assembly Government has stated its aspiration for all new buildings built in Wales from 2011 onward to be zero carbon.

67. To help achieve this goal and for wider sustainability purposes, the Welsh Assembly Government is promoting an 'Excellent' rating under the BREEAM environmental assessment framework – or an equivalent framework – for all new buildings in Wales, and is looking to have compulsory, challenging targets within BREEAM or equivalent for energy efficiency, water and waste reduction, to ensure key areas of environmental impact are tackled. To underline its commitment to improved standards and to provide an example and constructive challenge to other sectors, BREEAM 'Excellent' or equivalent is being set as a core condition of all Assembly Government funding, grants, investments, joint ventures and land disposals which involve new buildings.

68. The Welsh Assembly Government has recently consulted on amendments to Planning Policy Wales, and a proposed climate change compendium. The policy is yet to be finalised. However, the draft requires the introduction of policies into Local Development Plans for major development to reduce predicted CO_2 by 10% over current building regulations, to be achieved through a variety of measures, including improvement to the energy performance of buildings.

Promoting innovation

69. Government will lead the way, showing what can be achieved in new low-carbon developments in a series of demonstrations. These include:

- a demonstration project by English Partnerships, working with local partners, in Northstowe, Cambridgeshire, to create a new settlement of 10,000 homes, which will aim to achieve a 50% reduction on energy use compared with conventional housing;
- English Partnerships running a second phase of the Design to Manufacture competition, building on the lessons learnt from the £60,000 house, and pushing the boundaries further; and

- English Partnerships is also challenging the industry to build low cost, low carbon and zero carbon homes, but this time looking at whole developments rather than individual homes; and undertaking a feasibility study into the Thames Gateway becoming a low carbon development area within a decade, and whether and how fast we can move towards zero carbon thereafter.

70. The *Innovation Platform on Low Impact Buildings* will accelerate the development of cost-effective solutions to building zero carbon homes, and will tackle key challenges to upgrading the existing stock. The programme will support research where there are clear innovation gaps and will act as a technology accelerator for technologies that have not yet reached the market. It will do this by testing clusters of new technologies in a number of demonstrator programmes, initially residential and will encourage market deployment through measures such as public procurement in order to deliver value for money and stimulate markets for successful commercialisation of these new technologies. The programme will link with existing initiatives such as the Energy Saving Trust's Best Practice Programme and microgeneration field trials.

71. In tandem, the Office of Science and Innovation is running the *Foresight Sustainable Energy Management & the Built Environment Project.*[15] This will explore the technological and social impact of future systems for low carbon generation of heat and power and their interaction with current energy systems with the aim of determining how the UK built environment can evolve over the next 5 decades towards sustainable, low carbon energy systems.

Microgeneration – thermal technologies

72. The raising of standards in building regulations will necessitate more efficient and low carbon home heating systems, including micro-CHP, biomass heaters such as wood burning stoves, ground-source, water-source and air-source heat pumps, and solar thermal.

73. In 2005, the Energy Saving Trust assessed that there were 82,000 microgeneration installations of all types across the UK. Only 3000 of the 82,000 were generating electricity; 78,000 were solar water heating installed before 2000. In the past 5 years, installations of microgeneration have increased due to grant programmes and cost reductions. Solar water heating remains the largest market in the UK but growth is modest. MicroCHP installations have also grown without grant support from Government.

74. The Government's Microgeneration Strategy[16] was published in March 2006 and reported a study suggesting that 30-40% of the UK's electricity demand could be met through microgeneration technologies, with CHP leading the way.

75. Key Government initiatives to promote microgeneration include:

- the Low Carbon Buildings Programme – which offers grants to householders, communities & businesses for microgeneration;

[15] www.foresight.gov.uk/Energy/Energy.html

[16] www.dti.gov.uk/files/file27575.pdf

- review of planning to make it easier to gain permission for microgeneration installation;
- certification of microgeneration technologies; and
- proposals for zero carbon homes as set out above.

76. The Low Carbon Buildings Programme (covering the UK) encourages both energy efficiency and microgeneration technologies in buildings. It will allocate £86m of grants over a period of three years (between 2006-09) through two streams. The original £30m fund was supplemented by a further £50m to help fund the installation of microgeneration technologies in a range of buildings including schools, social and local authority housing, businesses and public buildings. A further £6m was announced in 2007 to support household microgeneration. The Energy Saving Trust has been appointed to manage the programme on behalf of the Government and will be responsible for administering capital grants to eligible applicants. Buildings Research Establishment (BRE) are technical experts to the programme and will be undertaking application assessment for Stream 2 applicants. The Carbon Trust will be providing building assessment assistance for applicants applying under Stream 2B.

77. In April 2007, the Government set out proposals for reforming the system of "permitted development rights" governing what householders can do to their own property without the need to apply for planning permission. The proposals would allow the easier installation of microgeneration technologies.

78. In September 2006, BRE Certification was awarded a Government contract to develop a robust third party certification scheme for microgeneration products and installers to take over from the existing product and installer registration schemes (Clear Skies and PV programme). This new scheme will underpin the Low Carbon Buildings Programme. Grants will only be available to applicants using both products and installers certified under the UK Microgeneration Certification Scheme.

79. Micro-CHP, or domestic scale CHP, is an emerging technology defined as all CHP schemes below 5KW electrical capacity. Micro-CHP units act like a condensing boiler when required to supply the heating needs to a household, but they also simultaneously generate electricity as part of the same process. This means Micro-CHP units will be more be energy efficient when compared to the conventional means of supplying domestic heating and electricity, via boilers and power stations respectively. This efficiency could offer significant reductions in household energy bills.

80. The statutory consultation on the Carbon Emission Reduction Target (CERT) (see paragraph 87), due to run from 2008-2011 will explore the need and potential for incentivising microgeneration technologies including Micro-CHP. All implications of any such approach will be considered, including whether offering incentives under CERT is justifiable and cost-effective.

81. The installation of domestic microgeneration attracts a VAT rate of just 5%. This VAT reduction is intended to give a signal of the Government's continued support for the development of this technology which has the potential to generate cost-effective carbon savings.

82. We are also working with the Energy Regulator to address how to make it easier for microgenerators including micro CHP to export electricity and sell it back to the grid. The Climate Change and Sustainable Energy Act confers powers on the Government to modify supplier licences to force them to offer tariffs for exported electricity – these powers come into force from August 2007.

83. Following on from the UK strategy, the Welsh Assembly Government launched a Microgeneration Action Plan in March 2007 setting out priorities for action in order to facilitate the uptake of microgeneration technologies in Wales. Welsh Assembly Government targets include:

- 20,000 micro-heat systems installed by 2012; of the order of 100,000 by 2020;
- 10,000 micro-electricity systems installed by 2012, of the order of 200,000 by 2020; and
- 50 CHP and/or district heating systems by 2020.

84. The Scottish Executive recently announced plans to develop an overarching Energy Strategy for Scotland. This is likely to include proposals for increasing the uptake of microgeneration in Scotland, and the role that this can plan in coherent approach to energy policy.

85. The Executive has committed £18 million until March 2008 to the Scottish Communities and Householder Renewables Initiative which offers grants to householders and communities for small scale renewable technologies. We have also review Scottish Planning Policy as set out above to encourage greater uptake of microgeneration, and are due to consult on the inclusion of microgeneration technologies as permitted developments.

86. The Executive is also developing a Renewable Heat Strategy. To date, renewables policy support in Scotland has focussed on the development of renewable electricity. Heating is another major energy sector, and we now need to focus on increasing the proportion of heat which is obtained from renewable sources. The Executive has established a forum with membership drawn from industry, academia, and the public sector to make recommendations on a strategy for renewable heat.

Tackling the efficiency of existing homes

87. Building Regulations are a powerful tool for raising the energy efficiency standards of new homes. However, the comparatively low rate of construction and the long lifespan of household building stock means that turnover of housing stock is very slow – around two-thirds of the housing stock that will be standing in 2050 is likely to have been built before 2005[17]. As the average existing home requires four times the energy to heat as one built to current minimum standards, tackling the energy performance of existing homes is crucial.

88. We have already achieved a great deal through existing policies to deliver improvements to homes in the UK, including the Energy Efficiency Commitment, Warm Front, Decent Homes and programmes in the Devolved Administrations. These programmes have seen half of all homes receive some form of energy efficiency measure. But there is also a great deal more that can be done. We want to see all homes achieve their energy efficiency potential. Our intention therefore is that by the end of the next decade, all householders will have been offered help to introduce energy efficiency measures.

The Energy Efficiency Commitment/Carbon Emissions Reduction Target

89. The Energy Efficiency Commitment (EEC) is one of the principal policy mechanisms by which we deliver energy efficiency improvement measures into existing homes in Great Britain. Under EEC, energy suppliers are required to achieve targets for the promotion of energy efficiency improvements in the household sector in Great Britain. Subject to approval by Ofgem, suppliers are given flexibility to choose from a range of measures, typically insulation, low energy lighting or high efficiency appliances and heating systems, in order to meet their targets. Suppliers may promote measures directly to consumers or work with project partners like social housing providers , retailers or manufacturers. Measures may be delivered in different ways, for example through a third party contractor, retail outlets or mail order. EEC has been highly successful in delivering cost-effective energy efficiency improvements and has acted as a model for similar schemes in a number of countries within the EU.

90. The assumed average cost to the suppliers of complying with the current phase of EEC (2005-08) is estimated at no more than £9 per customer per fuel per year. On average these costs are outweighed by the benefits consumers accrue from the energy efficiency improvement measures on offer from suppliers. At present, for reasons of equity suppliers are required to focus 50% of their savings target towards a priority group of low income customers.

91. Since the adoption of the 2004 Energy Efficiency Action Plan, the first three-year phase of EEC from 2002 to 2005 has concluded. During this phase energy suppliers delivered a wide range of measures and stimulated about £600m investment in energy efficiency delivering net benefits to householders in excess of £3 billion and expected carbon savings by 2010 of 0.3 MtC per annum. Building on this success, the current, second phase of EEC (2005-08), requires broadly double the level of activity of EEC1 and is

[17] Review of Sustainability of Existing Buildings: www.communities.gov.uk/pub/291/TheEnergyEfficiencyofDwellingsInitialAnalysis_id1506291.pdf

expected to deliver 0.5MtC annually in 2010 and is estimated to generate £400m per annum investment in energy efficiency.

92. In addition, the 2006 Climate Change Programme announced that the target for suppliers to promote energy efficiency improvements will be increased by a further 50 – 100% under the third phase, which will run from 2008 – 2011. In March 2007, the Government published the scores to be attributed to established measures allowed under EEC3, like cavity wall insulation and energy efficient lights. Together with the announcements of unlimited carry-over of activity, this will facilitate smooth transition from EEC2 to EEC3. Energy suppliers will be able to confidently overachieve against their EEC2 targets, or start work for their EEC3 targets early.

Expected carbon savings from the Energy Efficiency Commitment, 2002 – 2011.

	Expected Carbon Savings in 2010 (MtC) [19]
EEC1 (2002 – 2005)	0.3MtC
EEC2 (2005 – 2008)	0.5MtC
CERT (EEC3) (2008 – 2011)	1.1MtC

93. Statutory consultation on the third phase of EEC, now to be known as the Carbon Emissions Reduction Target (CERT) was launched in May 2007 and we expect the legislation to be in force by the end of 2007. The level of the target is roughly a doubling of the activity under EEC2 and at the highest end of the ambition suggested in the Climate Change Programme. Recently commenced provisions in the Climate Change and Sustainable Energy Act 2006 allow us to extend the scope of the obligation to include, in addition to energy efficiency measures, microgeneration measures and behavioural measures. CERT provides a new, more flexible routes for innovation and offer a broader range of options for business models, both with able–to–pay and priority group customers.

94. In addition the Northern Ireland Authority for Utility Regulation (The Utility Regulator) administers the Northern Ireland Energy Efficiency Levy. This was introduced in 1997/8 as part of NIE(T&D)'s price control. It now creates a fund equivalent to £7 per customer which equates to around £5.4m. In recognition of the widespread problem of fuel poverty in Northern Ireland 80% of the levy funding is spent on energy efficiency measures which target fuel poor homes. The remaining 20% is spent on wider energy efficiency schemes. The operation of the scheme is overseen by the Energy Saving Trust.

[18] The annual carbon savings for EEC1 and EEC2 were previously estimated to be about 0.4 MtC and 0.6 MtC in 2010; however, recent evidence suggests that some measures have lower savings than previously assumed which has reduced these estimates.

95. In Northern Ireland expected energy savings from the Energy Efficiency Levy by the end of 2007 are:

Year	GWh/a
2007/08	374.29
2008/09	373.74
2009/10	376.38
Total	1,124.41

Supplier Obligation Post 2011 and the promotion of Energy Services

96. To ensure the momentum built up under EEC/CERT is maintained into the next decade, the Government announced in the 2006 Energy Review that some form of supplier obligation would be in place until at least 2020, with an ambition level at least equal to EEC3/CERT. The post 2011 obligation will deliver annual savings of 3-4 MtC by the end of the next decade.

97. Our vision is to see a supplier obligation in which tackling the climate change impacts of their customers' energy usage becomes an integral part of suppliers' businesses. We want to see their businesses become increasingly about selling energy services rather than just units of energy on their own. CERT would be a first step towards creating such a marketplace, with its rewards for innovative approaches and domestic microgeneration. The continued obligation on suppliers to 2020 will provide a further incentive to move in this direction.

98. It is clear that the post 2011 supplier obligation will need to:

- mobilise investment and maintain levels of installation of least-cost energy efficiency measures affecting both electricity use and space heating, as under EEC;
- build on the success and experience of EEC/CERT, and in particular further encourage adoption of measures to address consumer behaviour alongside the installation of physical measures such as insulation;
- encourage innovation and bring on new technologies, especially as the opportunities for some of the traditional measures such as cavity wall insulation start to run out by the middle of the next decade. The obligation will also need to promote more expensive measures such as low or zero carbon energy technologies and solid wall insulation; and
- take account of equity issues – we need to consider carefully the social implications of a future supplier obligation on low-income households.

99. Government is now exploring possible options for the design of this policy. As part of this process, a Call for Evidence was issued in June which provides interested parties an opportunity to offer their views at an early stage in the policy development process. The Government intends to reach a clear conclusion on the direction for the post-2011 supplier obligation by 2008.

Energy End-Use Efficiency and Energy Services Directive

100. The Energy Efficiency Commitment only applies to gas and electricity suppliers. Article 6 of the Energy End Use Efficiency and Energy Services Directive will require the UK to place obligations on suppliers of other fuels to offer and promote either competitively priced energy services, energy audits or other energy efficiency improvement measures to their final customers. We will be consulting later this year on options for complying with this requirement.

Decent Homes

101. We have a target to ensure that all social homes in England are made decent by 2010. The Decent Homes standard is designed to ensure that social landlords tackle the worst housing conditions across a range of criteria. By ensuring that homes are warm, dry and have reasonably modern facilities, the delivery of the Decent Homes target has helped to make homes more energy efficient, as well as contributing to other cross-Government commitments to reduce health inequalities and tackle fuel poverty.

102. To be classed as decent, a home must provide a reasonable degree of thermal comfort, which means it must have effective insulation and efficient heating. Improvements to insulation and heating are a major focus of the decent homes refurbishment works.

103. The Decent Homes standard acts as a threshold that triggers action to improve homes which fall below it rather than a standard to which work is carried out. This ensures that resources are targeted at properties in the worst condition which will benefit most from improvement works. Furthermore, when carrying out these improvement works, landlords are encouraged to deliver a higher standard. Research by the Buildings Research Establishment[19] found the vast majority of local authorities and Registered Social Landlords are carrying out work well in excess of the thermal comfort standard with 90 per cent planning to install both cavity wall insulation and loft insulation in homes with gas or oil programmable heating where only one form of insulation would be required by the standard. The research survey also estimates that by 2010 around 85 per cent of lofts in social rented homes will have at least 200mm of insulation where as the standard requires a minimum of 50mm. Since 1997 the number of non-decent homes in the social sector has been reduced by over 50 per cent.

104. By 2010 we expect 95% of the stock to be decent by 2010 and the majority of landlords making all their stock decent in this timescale. Work will have been completed to 3.6 million homes, with improvements for 8 million people in total, 2.5 million children among them.

105. The Decent Homes programme applies to England but the devolved administrations of the UK administer similar or additional schemes which are:

- in Northern Ireland – the Department for Social Development is responsible for energy efficiency in the domestic sector, and works closely with the Housing Executive on this issue. The Housing Executive is designated under the 1995 Act as Home Energy Conservation Authority for Northern Ireland and has reported a 17 per cent saving in energy consumption since 1996 in occupied stock across all

[19] www.communities.gov.uk/pub/350/ImplementingDecentHomesintheSocialSector_id1506350.pdf

tenures. This level of saving was achieved from a broad range of schemes, including the Warm Homes Scheme, the Housing Executive's heating replacement programme and renewable energy pilot schemes. The energy efficiency levy, which was increased to £7 per electricity consumer in 2007was used to further underpin household energy efficiency with over 80% of this benefit being specifically targeted towards disadvantaged householders likely to be at risk of fuel poverty;

- in Wales – the Assembly Government expects all social landlords in Wales to adopt the Welsh Housing Quality Standard (WHQS) and to devise realistic programmes for bringing all their properties up to it by the end of 2012. The WHQS includes minimum standards of energy efficiency. Local authorities are required to provide the Assembly with an overall assessment of the condition of their stock and the investment needed to bring it up to the standard; and
- in Scotland – In February 2004, the Scottish Executive announced the Scottish Housing Quality Standard which includes a thermal efficiency standard to be attained (without disproportionate cost) by 2015 in properties owned by local authorities and registered social landlords . This has explicit requirements for the installation of 100mm of loft insulation, cavity wall insulation (where technically feasible and appropriate), insulation of hot water pipes and tanks and for the required full central heating system to be energy efficient. Although there is not a standard requirement for double glazing, this may be necessary in certain houses if there are problems with external noise or to ensure that the house meets the thermal efficiency standard.

Fuel Poverty Programmes

106. Fuel poverty is defined as when a household has to spend 10 per cent or more of its income on energy to maintain a warm home. The root causes and drivers of fuel poverty are the cost of fuel, the income of the household and the energy efficiency of the home. The Government's UK Fuel Poverty Strategy, published in November 2001 set out our targets on fuel poverty and how we would tackle the problem.

107. A range of programmes across Government contribute to tackling fuel poverty and have led to action in a number of areas to improve the energy efficiency and comfort of homes for the fuel poor. These include Warm Front and equivalent programmes in the Devolved Administrations, The Energy Efficiency Commitment (which makes a contribution to improving the energy efficiency of homes, with half of all measures directed towards a Priority Group of low-income households) and the Decent Homes Standard.

108. The Government's main programme for tackling fuel poverty in England through delivering improvement in energy efficiency is the Warm Front Scheme. Similar schemes exist in the devolved administrations: Scotland's Warm Deal and Central Heating Programme, Wales' Home Energy Efficiency Scheme and Northern Ireland's Warm Home Scheme. Access to Warm Front is through receipt of a qualifying income or disability related benefit and since its launch in June 2000 the Scheme has assisted around 1.4 million households in England. Households who are entitled for assistance under the Scheme can benefit from energy efficiency measures including insulation, draught proofing, efficient heating systems and energy efficient lighting.

109. Government remains committed to tackling fuel poverty and underlined this through increasing funding in the 2004 Spending Round and the last two Pre-Budget Reports. These actions bring total funding to tackle this issue to over £800 million for the 2005-2008 period in England. However, Government is not complacent and in light of the significant fuel price rises recognises that the attainment of our fuel poverty targets remains very challenging. It is estimated that emissions savings from Warm Front and other fuel poverty programmes in the UK are expected to be 0.4 MtC by 2010.

The Home Energy Conservation Act

110. The Home Energy Conservation Act 1995 (HECA) requires all UK Energy Conservation Authorities (local authorities with housing responsibilities) to prepare an energy conservation report identifying practicable and cost-effective measures likely to result in significant improvement in the energy efficiency of all residential accommodation in their area; and to report on progress in implementing the measures.

111. Energy Conservation Authorities in England have reported an overall improvement of approximately 16.7% for the period 1 April 1996 to 31 March 2005. The reported improvement to 31 March 2006 is expected to be published in July 2007.

112. The Home Energy Conservation Association (UK HECA), formerly known as the UK HECA Forum was set up with support from the Energy Saving Trust (EST) as a network to help local authorities share their expertise and resources in order to deliver their HECA strategies more effectively. The EST also assists local authorities to deliver their HECA and other energy responsibilities through initiatives such as the 'Practical Help' service which provides assistance and advice on implementing environmental policies including sustainable energy policy.

113. The Home Energy Conservation Act came into force in Wales in 1997. Evidence from local authorities' reports points to an improvement of 1 per cent per year over the first nine years of HECA. The Assembly Government introduced a HECA-type target into the most recent round of Policy Agreements negotiated with Local Authorities. In the first 2 years of the agreements Authorities reported increases of 2 per cent per year, effectively doubling previous progress.

114. The Home Energy Conservation Act was introduced into Scotland in 1996. This Act designated all Scottish local authorities as energy conservation authorities, each with a duty to devise strategies to achieve significant improvements in the energy efficiency of their respective housing stocks, across all tenures, over the next 10-15 years. All Scottish local authorities published their initial HECA strategies in 1997. These initial strategies were used by The Scottish Office (now the Scottish Executive) as the basis of agreeing individual target improvements in energy efficiency with each local authority. The individual local authority targets for improving energy efficiency, which take account of local circumstances and conditions, range from 8.5 per cent to 36.4 per cent on the original base case figures.

115. Scottish local authorities submitted their Third HECA Progress Reports during 2004. These reports provided information on both the incremental progress towards meeting their agreed HECA targets achieved between April 2001 and March 2003, and the

cumulative progress achieved since 1997. From these reports, it can be seen that local authorities are continuing to develop partnership arrangements to deliver energy efficiency measures: more than three-quarters of Scottish authorities having established formal partnerships involving other authorities, community sector agencies and utilities. Local authorities continue to develop policies aimed at taking the personal circumstances of households into account: over three-quarters have now made a commitment to tackling fuel poverty and targeting their advice and promotional activities on vulnerable households. The greatest increase in activity was seen in the delivery of direct energy advice. During the third reporting period, direct advice was provided to 148,063 households, a 50 per cent increase on the last progress report. Total reported expenditure on energy efficiency activities amounted to £428 million during the third reporting period, and a total of £1,297 million of expenditure over the first six years of HECA. The Fourth progress report will be published shortly and a review of HECA in Scotland is planned for later this year.

Fiscal Instruments

116. A range of fiscal incentives have been introduced to encourage home-owners and landlords to invest in improving the energy efficiency of existing buildings. A reduced rate of VAT at 5% is charged on certain energy saving materials, provided they are professionally installed in a residential or charitable property. The reduced rate covers:

- all insulation, draught stripping, hot water and central heating controls;
- installations of solar panels, wind and water turbines;
- ground-source and air-source hear pumps and micro-CHP; and
- wood-fuelled boilers.

In addition, grant-funded contractor installations of central heating systems and heating appliances; and grant-funded installations of factory-installed hot water tanks, domestic combined heat and power units, and heating systems that use renewable energy also benefit from the reduced rate. The Government is also committed to pressing at European level for a reduced rate of VAT for energy efficient products. If successful this will mean that households will benefit from lower prices if they purchase items such as loft insulation to fit themselves, and low energy light-bulbs.

117. A Landlord's Energy Saving Allowance (LESA) has also been introduced to provide an incentive for private landlords to improve the energy efficiency of the residential properties that they let. This offers upfront relief (up to £1500) for capital expenditure on investment in cavity wall and loft insulation. This was extended in 2005 to include solid wall insulation, in 2006 to include draught proofing and hot water system insulation, and again in 2007 to include floor insulation. The allowance has now been extended to 2015 and the Government is seeking State aid approval to extend its availability to corporate landlords.

118. To support the move to zero-carbon homes, the Government announced in the 2007 Budget that from 1 October 2007 all new homes meeting the zero carbon standard costing up to £500,000 will pay no stamp duty, and zero-carbon homes costing in excess of £500,000 will receive a reduction in their stamp duty bill of £15,000.

Improving the efficiency of the appliances we use in our homes

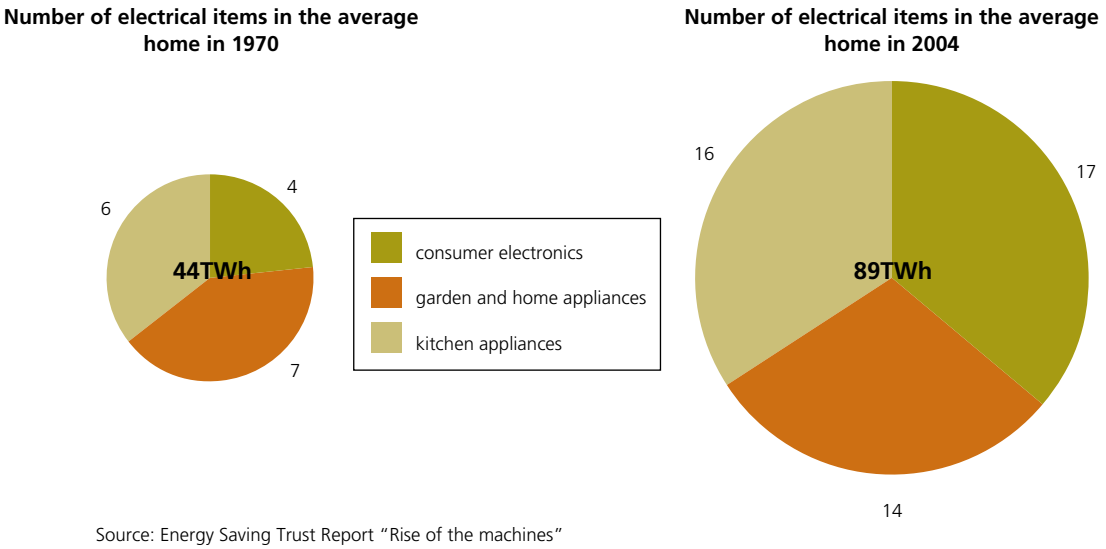
119. Of the UK's total electricity consumption 25 per cent is used to power lighting and appliances in the home. As the number of appliances we use in our homes grow, this domestic use of electricity is predicted to rise by 20 pr cent between now and 2020. If we are to reduce this growth in energy demand we need to find ways to make the products we buy and use as efficient as possible.

120. We use several ways to drive improvements in the energy efficiency of products, including EU legislation, voluntary agreements, labelling schemes, and building standards.

EU Legislation and International Agreements

121. The major energy using products such as electric motors, lights, household appliances, consumer electronics and air conditioning are internationally traded goods. That means that though we can, and do, take steps to encourage the take up of the most efficient products, we can only remove the least efficient products from the market altogether and raise standards by securing agreement to do so within the EU and internationally.

Figure 2: Electrical products in the UK home and their total UK electricity consumption, 1970 and 2004



Source: Energy Saving Trust Report "Rise of the machines"

122. Since the 2004 Action Plan, the EU has adopted the framework directive on Eco-Design of Energy Using Products (EuP)[20] and in the EU Energy Efficiency Action Plan (see paragraph 409), the European Commission have announced their intention to adopt minimum performance requirements for 14 priority product groups by the end of 2008. A further 7 product areas have also now been added. We will press for rapid delivery of implementing measures to raise standards.

[20] eur-lex.europa.eu/LexUriServ/site/en/oj/2005/l_191/l_19120050722en00290058.pdf

123. We are also working internationally to promote co-operation on product standards and labelling. The Gleneagles Plan of Action adopted under the UK Presidency of the G8 endorsed the IEA's 1 watt initiative on stand-by power and we are currently working through the UK led International Task Force on Sustainable Products to help develop the practical standards that will be needed to implement this commitment.

Transforming the UK market

124. The Government's Market Transformation Programme (MTP – www.mtprog.com) supports the development and implementation of UK Government policy on sustainable products. MTP works with policy makers, business and other experts at national, European and International levels to determine the scope to reduce environmental impacts through better product design.

125. At the heart of MTP is an informed and open consultative process, the development and promulgation of a shared policy model, Government priorities, an explicit list of product performance standards to develop and to apply and detailed policy action plans for each sector which set out an innovation roadmap by which Government and industry can work together to deliver more sustainable products.

126. Through the MTP we will consult on our evidence and analysis of how products and the markets for products could develop together with proposed targets for improvements in the energy standards and sales of the more efficient products. Following this consultation we will develop action plans for the next 10 – 20 years, which set out the agreed targets and measures for the market penetration of more energy efficient products. These will be updated annually. The first MTP consultation, which focuses on the consumer electronics sector, was published in May 2007, with the next set of consultation documents covering areas such as lighting and electronic motors due in Autumn 2007.

127. The EU has indicated that it will use the EuP Directive to phase out inefficient light bulbs across Europe. However, the legislation to permit implementation will not be completed until 2010, and it is likely that completion of any EU wide phase out will take a significant time afterwards. The Government has therefore been working with manufacturers and retailers of light bulbs in the UK, and aims to be the first EU country to phase out GLS bulbs for domestic use, where an efficient alternative exists, by 2011. This will reduce UK carbon emissions and lead to a saving of around £30 on the average household energy bill. To encourage the purchase of low energy light bulbs, the Government has also written to European Finance Ministers to recommend the introduction of a reduced rate of VAT for energy-efficient products.

128. As announced in Budget 2006, we will work with the supply chain and seek commitments from manufacturers, retailers and service providers to help us meet higher energy efficiency standards for the consumer electronic goods that retailers procure and sell to consumers. To date we have met with the major UK retailers of these goods and all have agreed to look in more detail at the energy consumption of the products they are selling and at the scope for action. Many retailers are already responding to this challenge by raising the issues with their own suppliers. In addition some are also seeking to expand the range of products.

129. As part of our work with retailers and manufacturers we have been exploring how we might translate the sometimes complex sets of technical standards and energy efficiency targets into an understandable and practical business planning tool. We are examining the development of an "online calculator" (see www.mtprog.com for more details). This could be used by retailers, manufacturers and others to test, easily, if individual energy-using products or their range of products will meet the Government's published indicative product standards (e.g. for stand-by power and energy efficiency).

130. The calculator could be used to examine the scope for changing performance specifications or sales volumes, to improve the overall carbon footprint of the range of products supplied. The calculator might also provide a convenient way for retailers and manufacturers to provide information to Government about their achievements and future plans to raise product standards.

131. The Government has also set energy efficiency standards in our own procurement activities and will promote them to others in the public and private sectors. On top of the value for money and environmental benefits gained through buying products meeting these standards, this commitment should stimulate competition amongst manufacturers to bring forward more efficient goods and services.

Providing Information and advice

132. Regulation, economic incentives and improvements in technology alone will not realise the full potential for energy savings. Evidence suggests that a lack of information and awareness amongst consumers about the energy efficiency options available to them and the perceived costs of taking action is acting as one of the principal barriers to improving energy efficiency in the household sector.

133. Government therefore has a vital role to play in addressing this lack of information in order to help individuals make informed choices that save energy and carbon. We do this by providing information on energy use and its impact on carbon emissions, by providing support and assistance to individuals looking to make greener lifestyle choices, embedding it in the education system and by ensuring that a supportive regulatory framework is in place to deliver improvements to the buildings and products that individuals can buy.

134. The Scottish Executive is currently undertaking an Independent Review of Energy Efficiency and Microgeneration Advice and Support in Scotland to assess the impact and effectiveness of the policies in the domestic, business and public Scotland. This will help develop future policies in this area.

135. The Welsh Assembly Government's Energy Saving Wales portal provides links to organisations that offer energy information, advice and support to householders, public sector and business (available at www.energysavingwales.org.uk).

Engaging with the Public on Climate Change

136. The Climate Change Communications Initiative (CCCI) was launched in December 2005, with a budget of £12 million over three years (2005/6 – 2007/8). The initiative was built on an evidence base which indicated that we needed to focus on helping people understand that climate change was a "here and now" issue, and emphasised the value of using "trusted intermediaries" to shift attitudes.

137. As part of the initiative the Climate Challenge Fund has granted funding of £8.5 million to 83 projects across England which are helping to encourage more positive attitudes towards tackling climate change. These projects work through community-based organisations and other trusted intermediaries such as the National Trust, the Scouts and local museums and galleries. The projects are working with varied partners including, for example, Rolls Royce, Tesco, and the NFU. Projects use creative communications including computer games, plays social-inclusion art projects, sports mentoring, community radio, and a national schools' carbon calculator competition.

138. The initiative has also produced freely available communication resources, including an award-winning two-minute film that has achieved £5.5 million free air time, has been downloaded 50,000 times over the web and gone to all British Embassies for use overseas. It has also gone to all secondary schools in the country as part of an assembly pack and has won three international prizes for excellence. DVDs of the film and the brochure "Your Guide to Communicating Climate Change" have been downloaded approx. 40,000 times and distributed another 6,000 times. The website, www.climatechallenge.gov.uk, has received an average of 120,000 page views/month. It and all the activities have been underpinned by a unifying brand 'Tomorrow's Climate, Today's Challenge' to give prominence and coherence to the Government's efforts in this area.

139. We have recently produced a new short film aimed at helping people make the link between their own actions, CO_2 emissions and climate change, which was launched in mid-April. This will be used as a TV filler, as well as on a DVD with the first film and footage of the Climate Change Champions in action. Along with a revised booklet, we hope it will be a valuable resource for community groups and others who want to communicate about how we can all help tackle climate change. In addition, the films have been distributed in a pack with the Al Gore film, "An Inconvenient Truth," to every secondary school in England.

140. Nine regional youth Climate Change Champions were selected through a national competition in May 2006, and have been communicating about climate change across the country. They have been excellent figureheads for the initiative: media coverage of the Champions is estimated to have already reached 18% of the adult population. The Youth Champions initiative has also engaged young people in the debate in an engaging and high profile fashion.

141. Over the coming months, a number of new tools are being produced through the initiative, aimed at helping individuals better understand the impact of their different actions on climate change. This reflects a new emphasis on behaviour change, and a contribution to broader work and activities taking place at the large-scale/national level.

142. We have launched a web-based CO2 calculator – allowing individuals and households to find out their CO_2 footprint. The calculator has the following key "selling points":

- the data and calculations have been recognised by Government;
- the results can be customised to individual or household;
- 3 areas of lifestyle (domestic heating, electrical appliance use and personal travel) are brought together in one calculator;
- advice is tailored to the individual, rather than generic; and
- recommendations are given on reducing and avoiding wasted energy, rather than simply offsetting.

143. The calculator will show that there are a range of actions we can all take – from the easy to the more challenging.

144. A consultation closed on 14 April 2007 on proposals for a Code of Best Practice on Carbon Offsetting. There has been criticism of offsetting, particularly in the national media, focusing on whether some of these schemes provide real emissions reductions and what the source of those reductions actually are. The aim of the proposed Code is to allow consumers to offset with confidence by giving accreditation to offsetting products meeting particular requirements. We would develop a quality mark to help consumers identify accredited products. We are currently reviewing the responses to these proposals received through the consultation.

145. This work contributes to a large-scale national campaign being run by Government aimed at engaging with consumers on climate change and wider pro-environmental behaviour change. The cross-Departmental multi-media campaign involves a number of elements, including on-line, press and TV advertising, and a Citizens' Summit on Climate Change, which took place in May. The aim of the campaign is to improve the public's CO_2 literacy in the first phase, moving on in the second phase to encourage and show individuals how to adopt more pro-environmental behaviours. The elements carry the common brand, "Act on CO_2"[21].

146. In Scotland it is recognised that only by raising awareness and working together can we hope to make a real difference in tackling climate change. The Scottish Executive is therefore committed to delivering climate change messages as widely as possible. Our sustainable development campaign `Its Our Future' – highlighted climate change and energy efficiency as two of its key issues.

147. The campaign initially ran between October 2006 – March 2007 and aimed to raise awareness amongst both a specific target audience of parents/guardians of children aged 7 to 14 years and, to a lesser extent, the general public. Activity consisted of TV, radio and cinema adverts and bill board posters. All promotion materials directed viewers to a dedicated website – www.infoscotland.com/ourfuture – for more specific information, including guidance on how to make a difference – in the home and community, as consumers, by volunteering etc – and offers links to relevant web resources.

[21] www.direct.gov.uk/en/Environmentandgreenerliving/actonco2/DG_067197

148. The advertising campaign was backed up by PR activity in a wide range of local and national media and a Scotland-wide competition for primary school children. The campaign also provided context and backing for a variety of specific communications activities by the Executive and other stakeholders using 'It's our Future' branding to link supporting activities in a similar way to the 'Act on CO_2' campaign. Examples of these supported activities include the 'Eco-drivers wanted' campaign, funded by the Executive and managed by the Energy Saving Trust, which urged motorists to Scotland's Central Belt to adopt eco-friendly driving habits that could help reduce their fuel use and play a role in tackling climate change; and the Scottish Building Standards Agency 'Home Improvements – a Sustainability Guide' website and supporting literature which offers practical information on enhancing the sustainability of homes.

149. The 'It's our Future' website remains active and work is underway to evaluate this initial campaign and consider opportunities for future activity.

150. In January 2007, the Scottish Executive announced a Climate Change Schools Initiative to be delivered by Learning and Teaching Scotland with support from Scottish Power. All Scottish secondary schools will receive access to a package of curriculum based on-line education materials on climate change at the start of the 07/08 academic year. This developing resource offers materials for use across a wide range of classroom subjects and will include copies of the film, An Inconvenient Truth.

151. The Welsh Assembly Government ran an initial Climate Change communications campaign in the first part of 2007, activity has included:

- improvements to the climate change related information on the Assembly Government website;
- climate change competition for schools;
- re-branding and translation of Defra climate change film and building this into the programme for developing a second film;
- two radio campaigns run (on energy and transport) and a further five ads recorded for future use;
- Ministerial announcements, visits and events;
- PR activity including case studies which has generated coverage in local press;
- Winter Roadshows including climate change as a theme, where advice leaflets and energy saving light bulbs were given away;
- announcement of intention to send *An Inconvenient Truth* to schools along with supporting material linking it to the curriculum; and

- publication of *Smarter Choices* transport guidance and launch of the transport *Act on* CO_2 campaign in Wales.

Work is underway to develop a longer term, more comprehensive campaign in partnership with other organisations.

Energy Performance Certificates

152. If people are going to make more informed decisions about the properties they buy or rent then providing information on a building's energy performance and the steps can be taken to improve that performance is an essential step. Energy Performance Certificates (EPCs) are designed to provide such information for both new and existing buildings and should be made available when buildings are constructed, sold or rented out. These certificates will provide an energy rating (from A to G) for the building and will set out what steps can be taken to improve its energy efficiency. The requirement to produce an EPC will be phased in between August 2007 and January 2009. For the owner occupied sector EPCs will have to be included as part of the Home Information Pack, which will be phased in from 1 August 2007.

153. In Scotland, new regulations were introduced on 1 May 2007 which require that all buildings subject to the building warrant application process submit an Energy Performance Certificate (EPC) as part of the completion certificate. Proposals to include an EPC for marketed properties within the Single Survey Property Information Pack (PiP) have been subject to consultation. Responses to the consultation will be published in August 2007. The Scottish Building Standards Agency will work with partner organisations from within the public and private sector to ensure that EPC mechanisms are in place to produce EPCs for tenants by January 2009.

154. Home Information Packs are not being introduced in Northern Ireland as the practice and dynamics of the housing market are different to those experienced in England and the Department of Finance and Personnel is working to produce separate regulations for the introduction of Energy Performance Certificates.

155. In Northern Ireland the Home Charter Scheme requires solicitors acting for vendors to produce all information up front (except a survey) before a contract is signed. There is currently a review of land law and conveyancing law being carried out in Northern Ireland and the workings of the Home Information Packs in England will be monitored in the meantime.

156. We also recognise of the importance of the giving householders the support they need to make the changes recommended within Energy Performance Certificates and of offering a clear pathway to action. Working with Energy Saving Trust and other key participants, we are exploring how we can provide a better service for households that brings together in one place advice on approved local suppliers, information about grants available, advice on microgeneration, as well as signposting householders to other initiatives such as the recently expanded Warm Zones and help from energy suppliers under EEC/CERT.

Energy Saving Trust programmes

157. The continued work of the Energy Saving Trust (EST) remains a cornerstone of our commitment to improve energy efficiency. EST is a private company funded by Government to support household energy efficiency activities. Through the Trust we are already engaging with over one million households annually providing advice on energy efficiency and carbon emissions reductions.

158. EST has several core activities directed at household consumers:

- the work of the network of Energy Efficiency Advice Centres (EEACs) which provide advice to consumers to help them assess their energy use and refer them on to any available grant offers;
- the EST have piloted the Sustainable Energy Network (SEN) as a key delivery route for more effective advice to consumers, engaging proactively and enabling individuals to make personal commitments to reduce carbon. In addition to energy efficiency, SEN's will promote carbon saving through renewables and transport. The SEN is planned to replace the EST's network of EEACs;
- on-line Home Energy Checks – a personalised report showing consumers how much energy and money they can save in their home;
- the *Save Your 20%* consumer marketing campaign, which is a source of information and call to action for consumers to reduce their energy use and install energy efficiency measures;
- accreditation of products under the Energy Saving Recommended label, which signposts consumers to products that save the most energy and maintenance of an on-line searchable database of energy efficient products; and
- for local authorities and registered social landlords, EST administers a number of programmes including Practical Help, a tailored source of information and support on delivering energy efficiency to their communities;

The Energy Saving Trust also works in partnership with the Devolved Administrations.

EST Wales office

159. The Energy Saving Trust's office in Wales provides information on energy efficiency issues to all departments in the Assembly and partners across Wales. EST Wales works closely with the Welsh Assembly's Sustainable Energy Group (NASEG) and the Wales Home Energy Conservation Act (HECA) Forum which includes all 22 local authorities and partners such as the managing agents of the fuel poverty programmes, energy suppliers and installers. The Energy Saving Trust is also represented on the Assembly Government's Cross Sector Climate Change Group and has contributed to the Assembly Government's initial climate change communication campaign.

160. The Energy Efficiency Advice Centres in Wales support local authority activity under the HECA, and some additional management support for a range of programmes including education, health and business. EST is part funding an officer in the Welsh Local Government Association (WLGA) to work with local authorities on developing their energy efficiency activity. EST Wales also promotes awareness of the Low Carbon Buildings Programme with registered social landlords, and promotes grants for R&D on alternative fuels and infrastructure development that are administered by EST.

161. The Welsh Assembly Government has awarded funding to the Energy Saving Trust to bring forward development of the Sustainable Energy Network in Wales. This would strengthen the infrastructure in Wales for advice on energy efficiency, renewable energy and transport to households, communities and micro businesses.

EST Scotland

162. The Scottish Executive fund almost all of EST's work in Scotland. EST Scotland works closely with the Scottish Executive and other Scottish stakeholders. The Executive is funding the EST to introduce a Scottish Sustainable Energy Network from April 2008. In addition, EST Scotland manages certain Scotland-only programmes including:

- the Business Adviser Network, a Scottish-wide programme which provides guidance and support, including energy audits to small and medium sized enterprises;
- transport advice delivered through travel plans and green fleet reviews for business and the public sector, and consumer advice to encourage behavioural change by individuals through initiatives such as eco-driving;
- the Local Support Service which assists local authorities in developing and funding sustainable energy projects and helping them to meet their obligations under the Scottish Climate Change Declaration; and
- the Scottish Community and Household Renewables Initiative (SCHRI) providing grants and advice to households and community organisations installing renewable technologies.

EST Northern Ireland

163. The Energy Saving Trust (EST) Northern Ireland works with two Energy Efficiency Advice Centres in Belfast and Enniskillen giving advice to consumers and small businesses. EST Northern Ireland has key partnerships with Northern Ireland Electricity, Phoenix Natural Gas, the Northern Ireland Housing Executive and local authorities, and facilitates a Fuel Poverty Partnership Group which includes local representatives of Government, the energy industry and fuel poverty stakeholders.

164. EST Northern Ireland also monitors and evaluates schemes funded by the Northern Ireland Energy Efficiency levy on electricity consumers, on behalf of the Northern Ireland Authority for Utility Regulation.

Labelling

165. Energy labels provide clear and easily recognisable information for consumers about the relative energy consumption and performance of domestic appliances. Mandatory EU Energy labels use an A (most efficient)[22] to G (least efficient) label, which enables consumers to make an informed choice in their purchasing decisions by enabling them to identify appliances which use less energy and (where applicable) water when in use. The label also includes information on the estimated energy used by the appliance which can be converted to approximate running costs. These labels also enable manufacturers to compete against each other on the environmental performance of their products.

166. Mandatory EU energy labels are required to be displayed on household refrigerators & freezers, washing machines, electric tumble-dryers, combined washer-dryers, dishwashers, household electric ovens, air conditioning units and lamps at the points of sale.

167. The European Commission has started a review of the EU mandatory energy labelling scheme to identify how the regime can be expanded to cover more products and made more effective through strengthened monitoring and compliance and improving the accuracy of the information underlying the label.

168. The UK will continue to work closely with the Commission to achieve these aims. Our priorities include:

- extending the scope of the Directive to include, at least, non-domestic energy using products (other than transport) – that is, to mirror the scope of the Eco Design for Energy Using Products (EUP) Framework Directive;
- encouraging voluntary actions by industry to provide consumer information, as an alternative to regulation – again, mirroring the provisions in the EUP directive;
- making it easier for enforcers to establish compliance with the directive; and
- making the scheme more dynamic so that continuous improvements in energy efficiency are achieved.

169. In addition, the Energy Saving Trust (EST) administer the Energy Saving Recommended label scheme with only products that meet strict criteria on energy efficiency carrying the logo, for example, for fridges EST endorse A+ which are more energy efficient than A rated products and the washing machines on the scheme must be AAA: A for energy, A for wash quality and A for spin. The label makes it easier for consumers to recognise the top-performing appliances.

170. The criteria are set by an independent panel and reviewed annually. In addition EST test a percentage of products. The label also covers products in categories where there isn't a statutory EU Energy label for example glazing, televisions with integrated digital decoders (IDTVs) and boilers.

[22] The most efficient fridges & freezers are now identifiable by A+ and A++ markings appearing against the A arrow

Metering and Billing

171. Ensuring householders have easy access to accurate information about their energy use within their homes will enable consumers to manage that use more effectively and reduce their carbon emissions. We announced in the Energy White Paper that Government intends to roll forward a package of measures which will change the way in which energy use is metered and billed.

172. Our expectation is that, in the future, all energy customers will have smart meters with visual display units that allow communication between the meter, the energy supplier and the customer. Through smarter meters, readings can be taken remotely, ensuring that all bills are accurate. Meters can be remotely switched between credit and prepayment, reducing supplier and customer costs. Electricity suppliers will also be able to offer new products that may incentivise customers to use less energy at peak times or to use less energy overall.

173. As a starting point the energy demand research project, co-funded by Government and industry, will involve several thousand households receiving smart meters or feedback devices, displaying real-time energy use. The project, managed on the Government's behalf by Ofgem, will involve trials of different ways of improving billing and metering. The trials will provide information on reductions in energy use that consumers make in response to different forms of feedback about their energy use and test consumer response to time of use tariffs that encourage energy use to be switched away from peak periods. The latter has the potential to deliver savings in investment in new energy infrastructure to meet peak demands. Final details of the project are currently being negotiated with participating companies, following which the trials will commence swiftly. The project will run for two years, with regular interim reports on emerging findings and will inform the further development of policy on smart meters and associated feedback devices.

174. Suppliers are already rolling out smart meters in the business sector and are considering the business case for their use in the domestic market. Any future decisions on their roll-out by energy suppliers will draw on the evidence coming from the trials of smart meters and real-time displays.

175. We welcome the progress being made by suppliers, with the support of Ofgem to remove barriers to the roll out of smart metering. Suppliers and manufacturers are also examining the scope for developing metering that can communicate in such a way as to reflect the widespread use of dual-fuel (both gas and electricity) contracts. They are also exploring the scope for commercial arrangements that would permit shared communications systems and data between companies.

176. The Government expects to see smart meters with a visual display of energy use rolled out to the domestic sector within the next decade. The Government has made clear its commitment to facilitate these developments, but does not consider that we should regulate how it is done. Instead, we intend to allow the energy suppliers to determine the most cost-effective approach for their companies to deliver this commitment within the timescales we have set.

177. The visual display will provide household customers with readily accessible information about their energy usage. With the intention that displays be provided with smart meters in the longer term, Government has considered their role in the shorter term. We believe that customers who are interested in real time displays should have ready access to them. Whilst the displays are available through retailers, gas and electricity suppliers may be in a better position to deliver them cost-effectively to customers, and some suppliers are doing so on a small scale.

178. In the Energy White Paper we proposed that from May 2008 and where technically feasible, every household having an electricity meter replaced and every newly built domestic property will be given a real-time electricity display free of charge. The display must show real-time information about electricity consumption and cost and meet a minimum performance requirement of 95% accuracy in the normal range of energy use by a household.

179. In addition, from as soon as possible in 2008 to March 2010, any household requesting a real time display for their electricity meter should be given one free of charge, by their energy supplier. We estimate annual carbon savings from these cost-effective short-term measures of up to 0.3 MtC by 2020. The Government will also consider how to incentivise innovation in relation to household displays of gas consumption and cost, in line with the Government's commitment in the Climate Change Programme.

180. Government also supports energy supplier initiatives to offer customers information through transmitting energy use via digital technology to a television, mobile telephone or personal computer. We will discuss with interested parties what part Government can play beyond the work that is already in hand

181. The Government also believes that additional information on bills or statements can help customers reduce their energy consumption. Following its consultation on billing and metering, we have concluded that historic information, which compares energy usage in one quarter with the same period the previous year, would be of value to domestic customers. We therefore announced in the Energy White Paper that we would work with gas and electricity suppliers to incorporate within supply licences a requirement to provide comparative historical information, on the bill or statement, or, for those customers with internet-based contracts, electronically, preferably in graphical form. This proposal will also implement article 13.3(b) of the Energy Services Directive.

182. We estimate that together these proposals for billing and metering will deliver annual savings of up to 0.5 MtC by 2020.

Energy End-Use Efficiency and Energy Services Directive

183. Article 7.2 of the Energy End-Use Efficiency Directive requires that Member States ensure that greater efforts are made to promote energy end-use efficiency. Member States are also required to establish appropriate conditions and incentives for market operators to provide more information and advice to final customers on energy end-use efficiency.

184. A range of policy activities including those of the Carbon Trust and Energy Saving Trust, the Energy Efficiency Commitment and the further development of the supplier obligation already contribute to this goal. We will consider what if any further action may be needed in consultation with stakeholders.

The Business and Public Sectors

Summary of measures

To improve the energy efficiency of organisations in both the public and private sector we:

- will continue to use the EU ETS as the key mechanism to reduce emissions in energy intensive organisations, and will seek to strengthen and expand the scheme beyond 2012, driving energy efficiency as a low-cost means of emission reduction;
- have established a Climate Change Levy, to reduce energy use in industry and the public sector, and associated Climate Change Agreements which reduce the Levy for those who commit to emissions reductions or improved energy efficiency targets;
- will implement a Carbon Reduction Commitment (CRC) cap-and-trade scheme for large commercial and public sector organisations to secure 1.2 MtC per year by 2020;
- have completed a voluntary UK Emissions Trading Scheme (UK ETS) pilot that provided an opportunity for businesses in the UK to gain first-mover advantage over competitors;
- continue to fund the Carbon Trust to help UK business and public sector improve their energy efficiency and reduce their carbon emissions; and to support the development of a UK industry sector that capitalises on the innovation and commercial value of low carbon technologies;
- have made advanced metering mandatory for large energy users to help them make more informed choices about their energy use;
- will consult on the implementation of a proposal that energy suppliers should provide all but the smallest non-household users with advanced metering services within the next 5 years;
- will ensure that buildings will have an Energy Performance Certificate whenever they are constructed, sold or rented out;
- will ensure that public buildings over 1000m2 display a Display Energy Certificate, and will consider extending this requirement to other buildings such as hotels, banks and retail outlets;
- fund the Carbon Trust's Research & Development work, encouraging innovation, accelerator projects and assistance for pre-commercial and commercial organisations via venture capital investment;
- are using building regulations to encourage businesses to improve the efficiency of boilers, heating systems and air conditioning systems; and
- are promoting the uptake of Combined Heat and Power (CHP).

To improve the energy efficiency of businesses we:

- have introduced and developed the Enhanced Capital Allowances (ECA) scheme which provides businesses with a first year 100% tax allowance on designated energy efficient equipment investments;

Summary of measures (continued)

- provide loans, through the Carbon Trust, to small and medium sized enterprises for qualifying energy efficiency investments, and in Scotland through the Scottish Executive funded Loan Action Scotland; and
- fund through the Scottish Executive, a dedicated Business Adviser Network in Scotland to provide a range of free services including telephone and face to face advice, energy audits and reports, and signposting to appropriate sources of funding or further specialist support.

To improve the energy efficiency of the public sector, for the Government estate in particular we:

- have set new targets for Sustainable Operations on the Government Estate, with the aim of reducing emissions by 30% by 2020, to reduce emissions by road vehicles by 15% by 2010/11, to make the Central Government offices carbon neutral by 2012, and for Departments to increase their energy efficiency by 30% per m^2 by 2020;
- have adopted a Sustainable Procurement Action Plan, to move towards a sustainably built and managed Government Estate and wider public sector;
- will engage with employees using internal communications to provide information and advice for employees;
- will ensure that public buildings over 1000m^2 display an Energy Performance Certificate;
- have provided funding for Salix Finance to establish a revolving fund for energy efficiency work in the public sector, building on the pilot Local Authority Energy Financing (LAEF) Scheme; and
- have provided, through the Scottish Executive, £20 million to the Central Energy Efficiency Fund – a revolving loan fund for energy efficiency work with all Scottish Local Authorities, Scottish Water and the NHS Scotland. A further £4 million has been committed to expand this scheme to the Further and Higher Education Sector in Scotland.

To improve energy efficiency in the Health Service we:

- have set, and are making good progress towards, targets to reduce the amount of primary energy consumed by 15% by 2010 with mandatory requirements for 35-55 Gj/100m3 for new build and 55-65 for refurbishments along with NEAT 'excellent' for new build and 'very good' for refurbishments;
- partner the Carbon Trust to support and advise health services through a tailored Carbon Management Programme; and
- have introduced a £100m Energy and Sustainability Capital Fund for the NHS in England to promote initiatives and make progress towards achieving the energy consumption targets.

Summary of measures (continued)

To improve energy efficiency in the Education sector we:

- have adopted a Sustainable Schools Action Plan for England, highlighting the action Government will take to ensure that schools have all the support they need to become models of sustainable development. We will set out targets for the environmental performance of the schools estate covering carbon emissions and high standards for energy efficiency, renewable energy and other carbon reduction methods; and
- will improve efficiency and reduce energy use as school buildings are refurbished or replaced as part of the 15 year Building Schools for the Future (BSF) programme and will work with Higher Education Institutions towards sustainability and emission reductions, including advice and assistance from the Carbon Trust.

To improve energy efficiency in local and regional government we:

- are reviewing the local government performance framework, with an aim to include an appropriate focus on climate change;
- have identified 'Beacon Councils' undertaking exemplary work in the field of sustainable energy, and will assist those who need help raising their performance; and
- are taking action regionally, with Regional Development Agencies (RDAs), Regional Assemblies and Government Offices. Energy partnerships now exist in all regions, taking forward projects aimed at reducing emissions.

Summary of energy savings

Policy	Expected energy and carbon savings in 2010		Expected energy and carbon savings in 2016		Expected energy and carbon savings in 2020	
	TWh	MtC	TWh	MtC	TWh	MtC
Building Regulations E&W 2002	5.9	0.4	6.5	0.4	6.5	0.4
Building Regulations E&W 2005/6	3.2	0.2	12.0	0.7	19.0	1.2
Building Regulations Scotland 2007	0.5	0.0	1.9	0.1	3.1	0.2
Carbon Reduction Commitment (CRC)	1.1	0.1	6.3	0.6	11.8	1.1
Product Policy	2.2	0.2	8.1	0.7	12.1	1.1
Energy Performance of Buildings Directive	0.0	0.0	4.8	0.4	8.1	0.6
UK Emissions Trading Scheme (UKETS)	3.5	0.3	3.5	0.3	3.5	0.3
Carbon Trust programmes	14.6	1.1	14.6	1.1	14.6	1.1
Private sector specific:						
Climate Change Agreements (CCAs) excl EUETS installations	3.9	0.3	3.9	0.3	3.9	0.3
Smart metering	1.3	0.1	2.1	0.2	2.7	0.2
Carbon Trust SME fund	1.2	0.1	1.3	0.1	1.3	0.1
SME measure	1.2	0.1	1.2	0.1	1.2	0.1
Public sector specific:						
Devolved Administrations	3.7	0.3	4.1	0.3	4.1	0.3
Revolving Loan Fund	1.1	0.1	1.2	0.1	1.2	0.1
TOTAL BUSINESS AND PUBLIC SECTOR	**43.4**	**3.3**	**71.5**	**5.4**	**93.1**	**7.1**

Notes:

(1) Annex A gives further information on the methods used to estimate likely energy and emissions savings, the methods used to measure savings from past measures.

185. The business and public sectors together are responsible for over a third of UK Carbon emissions. Significant potential exists for reducing these emissions while at the same time delivering bottom line financial benefits using existing energy efficiency technologies.

186. The Government is therefore committed to providing a clear, flexible and stable policy framework to reduce greenhouse gas emissions and improve energy efficiency within which industry, commerce and the public sector can make long term planning and investment decisions and do so in the most cost-effective manner. As the Stern Review highlighted, a vital element of that framework is the need for a strong carbon price signal and economic instruments have already proven to be an effective lever to drive investment in low carbon technologies. The climate change levy, emissions trading, enhanced capital allowances and climate change agreements have all already achieved considerable success in delivering energy efficiency improvements and carbon savings. If this progress is to be maintained then it will be important to build on existing measures, particularly the EU Emissions Trading Scheme which can become the basis of a global carbon market.

187. Many organisations recognise the benefits that investment in energy efficiency can bring, through lower costs, improved competitiveness and improved social and corporate standing. However, short term cost considerations, lack of information and market failures can act as barriers to investment. To overcome these, Government recognises that it has a role to play. Firstly by raising awareness of the impacts climate change will have on business and enabling organisations to make more energy efficient choices through the provision of information and advice on energy management and energy efficiency. Secondly by creating the right incentives, including a credible carbon price for long term investment in cost-effective energy efficiency measures. And thirdly by setting now the future regulatory framework that will drive improvements in the energy efficiency of commercial buildings and products.

188. Furthermore, the Government must lead by example and has set itself the ambition of delivering carbon-neutral Government office estate by 2012. Government, along with local authorities, is one of the country's largest landowners and buyers of goods and services, and can bring public sector purchasing power to bear to drive up energy efficiency standards by setting market standards that will over time become the norm for all purchasers.

Incentives for investment – providing a carbon price signal

The EU Emissions Trading Scheme

189. The EU Emissions Trading Scheme (EU ETS) is at the heart of the UK's wider strategy for reducing greenhouse gas emissions and tackling climate change.

190. The EU ETS uses a market-based mechanism to incentivise the reduction of greenhouse gas emissions in a cost-effective and economically-efficient manner. The scheme operates through the allocation and trade of greenhouse gas emissions allowances throughout the EU. The EU ETS plays an important role in giving organisations a clear incentive to reduce carbon emissions at least cost, and consequently improving energy efficiency.

191. Phase II of the scheme is set to run from 2008 until 2012, and the UK's National Allocation Plan (NAP) for Phase II is set to deliver savings in emissions of 8MtC per year. The Government is aiming to secure EU agreement to a number of changes to help strengthen the EU ETS post-2012. These include:

- assigning a high priority to producing as soon as possible in 2007 a legislative proposal that strengthens the operation of the scheme. Key to this will be providing greater certainty to installations to incentivise investment in abatement technologies. One part of this will be considering whether signalling the direction of EU emissions reductions over a longer period into the future would be advantageous. This would give certainty to investors in low carbon technologies and signal EU-wide commitment to reduce carbon emissions beyond 2012;
- making early decisions on emissions caps to provide organisations with confidence about a long term meaningful carbon price and consider the role that centrally set caps might play in providing this confidence. Caps should decline over time;

- setting the EU ETS cap to help deliver the EU's commitment to cut its greenhouse gas emissions by 20% by 2020, or a 30% cut if in conjunction with other industrialised countries;
- move towards increased auctioning of allowances in future phases to improve the efficiency of allowance allocation, while taking account of competitiveness implications;
- recognise carbon capture and storage (CCS) fully within the EU ETS from 2013 onwards, and to agree to UK CCS projects being brought within the scope of the scheme during Phase II (2008-2012) through a unilateral opt-in;
- explore the potential to expand the scheme to cover additional sources of emissions, including surface transport, and press ahead with the inclusion of aviation;
- consider the scope for greater harmonisation, particularly in areas such as allocation, to tackle concerns about competitiveness impacts; and
- move to ensure the EU ETS is at the centre of a global carbon market post-2012 by considering how the EU ETS Directive should be amended to facilitate the future linking of EU ETS to other schemes.

192. The Government is committed to there being a continuing carbon price signal which investors take into account when making decisions. The EU ETS will remain the key mechanism for providing this signal. The Government will continue to work with its international partners to strengthen the EU ETS to make it more effective. We will keep open the option of further measures to reinforce the operation of the EU ETS in the UK should this be necessary to provide greater certainty to investors.

193. Energy Efficiency improvements in the EU ETS sector do not count towards the achievement of the energy saving target in Chapter 2.

The Climate Change Levy and Climate Change Agreements

194. The UK business and public sector is subject to a tax on their energy use – the Climate Change Levy – introduced in 2001 designed to incentivise industry and the public sector to reduce their demand for energy. The current rates of the Climate Change Levy, which were increased in line with inflation in April 2007, are:

Fuel	Rate
Electricity	0.441 penny per kilowatt hour (kWh)
Natural gas	0.154 penny per kWh
Solid fuel e.g coal or coke	1.201 pence per kg
Liquid petroleum gas for heating	0.985 penny per kg

195. Climate Change Agreements (CCAs) were introduced as part of the Climate Change Levy package. Under these agreements, participating industries receive an 80% discount from the climate change levy, provided that they enter into agreements with Government to meet energy efficiency targets or reduce their carbon emissions. CCAs have successfully delivered substantial carbon savings in their first five years and are

expected to continue to perform well. There are around 5,000 companies, covering around 140,000 sites in 542 sectors, now covered by agreements.

196. To ensure the targets remain challenging but realistic, they are periodically reviewed. The first review, for the 2006 to 2010 period, took place in 2004 and the current 2010 targets will be reviewed again in 2008. CCAs currently run until 31 March 2013. The final target period is 2010, and facilities that meet this target will be eligible to continue to pay the reduced rate of the Climate Change Levy until 31 March 2013.

197. In order to underpin achievements to date, Government will consider, in good time before the expiry of the current agreements, the future of CCAs and how we can take the objectives forward.

198. Energy Efficiency improvements delivered through the Climate Change Agreements in sectors covered by the EU ETS do not count towards the achievement of the energy saving target in Chapter 2.

The Carbon Reduction Commitment

199. The recent Energy White Paper stated the Government's commitment to implementing the Carbon Reduction Commitment – a mandatory emissions trading scheme for the large non-energy intensive sector, covering both business and the public sector, which will deliver carbon savings of 1.2 MtC per year by 2020[23].

200. To minimise administrative burdens the scheme will focus on large organisations for whom the energy efficiency benefits would outweigh the administrative costs. The CRC will cover emissions from energy use by organisations with mandatory half hourly metered electricity consumption of more than 6000MWh/year. This would generally capture organisations with annual electricity bills above £500,000.

201. CRC will target CO_2 emissions from both direct and indirect energy use (i.e. the use of electricity) and to avoid overlap with existing measures, the CRC would not target emissions covered by Climate Change Agreements nor direct emissions covered by the EU ETS. In addition, organisations with over 25% of their energy use emissions in CCAs would be completely exempt. CRC will be a "light touch" scheme by allowing self-certification of energy use and emissions, backed by an independent risk based audit regime.

202. To further minimise administrative burdens, CRC allowances will be auctioned so participants will be able to determine their own emissions targets within the scheme. The auction revenue will then be recycled to CRC participants in proportion to average annual emissions since the start of the scheme, with a bonus/penalty depending on position in an CRC league table, so the scheme will be broadly neutral to the Exchequer.

[23] The total savings of 1.2 MtC will be delivered through a combination of the Carbon Reduction Commitment, delivering 1 MtC and implementation of the Energy Performance of Buildings Directive which will deliver around 0.2 MtC.

203. In order to ease participants into the new regime, and to allow Government to establish more accurate data on emissions across the target sector, CRC will feature an introductory phase, featuring a fixed price-sale ahead of the full 'cap and trade' scheme. The earliest CRC can start is 2009, and a consultation on the implementation of the scheme will be published this summer.

UK Emissions Trading Scheme

204. The UK Emissions Trading Scheme was a five year voluntary pilot scheme, starting in 2002. Participants bid annual, cumulative greenhouse gas emissions reductions set against a 1998-2000 baseline, in return for a share of Government incentive money of £215 million. Direct Participants committed to reduce their emissions by 1.08 MtC over the five years.

205. The scheme ended in December 2006 with participants having achieved emissions reductions of 7.2mtCO_2e – greatly in excess of their original target. In addition to this the scheme enabled "learning by doing" for both participants and Government and helped to establish the City of London as a centre for emissions trading.

Advice and Information

Carbon Trust Programmes

206. The Carbon Trust is a private company launched in April 2001, as part of the Climate Change Levy package to take the lead on business and public sector energy efficiency and encourage the development of a low carbon sector in the UK. Government grant funds the Trust in furtherance of its own climate change objectives, with the Trust identified to save 1.1MtC by 2010 in the UK Climate Change Programme 2006.

207. As part of its "Solutions" programme, the Trust offers a broad range of tailored services to help organisations identify their carbon emissions and finding ways to cut them. This includes:

- the "Carbon Management" scheme which provides a strategic view of the impacts of carbon emissions by identifying the risks and opportunities associated with climate change and which is offered to large UK corporations and a range of public sector organisations;
- the "Carbon Management Energy Efficiency" scheme which provides energy efficiency advice for large firms with energy bills greater than £1m/annum looking to reduce energy costs;
- free site surveys which for organisations with annual energy bills of over £50,000 to identify energy-saving opportunities and offer practical advice on how to achieve these;
- "Networks" programme which offers guidance to trade and professional bodies and unions, as well as funding for projects leading to quantifiable reductions in carbon emissions;

- an advice line and website giving expert energy efficiency information for all organisations, though of particular use for smaller companies with annual energy bills under £50,000; and
- a comprehensive library of free publications giving sector-specific guidance and technology guides covering the issues to consider when choosing and operating a wide range of different equipment.

208. Over the coming years the Trust is looking to expand its "Solutions" services to broader, strategic services to address indirect emissions reduction in the supply chain. Further details of the Trust's work can be found at its website www.carbontrust.co.uk.

209. The Trust has made significant progress on this over recent years, launching, for example, major new projects to accelerate the commercial development of biomass heat and marine renewable energy and a coordinated package of university-based research funded jointly with the Engineering & Physical Sciences Research Council (EPSRC).

210. Carbon Trust teams in Wales, sponsored by the Welsh Assembly Government, and in Scotland, sponsored by the Scottish Executive are responsible for the promotion and delivery of the Carbon Trust's activity and service to business and public sector organisations in Wales and Scotland. These activities complement Welsh Assembly Government and the Scottish Executive policy objectives as particularly in relation to combating climate change, cutting carbon emissions, reducing energy consumption and costs, increasing resource efficiency and competitiveness of business and helping develop low carbon technologies.

211. The Carbon Trust technology acceleration programmes and projects help develop technologies as well as a means of gathering evidence and data for broader dissemination. The Low Carbon Building Accelerator has been an initiative of particular interest to Wales where 2 of the pilots are being run.

212. The Welsh Assembly Government is also supporting EST to accelerate the establishment of a Sustainable Energy Network in Wales by end of 2007 which will also provide advice to micro-size business.

Metering and Billing

213. Advanced metering is already mandatory for large users (the half-hourly electricity and daily-read gas markets). This kind of information on actual energy usage, combined with energy saving advice, are the tools organisations need to make more energy efficiency choices and investments. Increasingly, suppliers and metering companies are offering advanced metering services and contracts to smaller users. A recent Carbon Trust trial of smart metering for SMEs demonstrated that companies using these services can achieve energy and cost savings.

214. In the Energy White Paper Government announced its intention to consult in 2007 on a proposal that energy suppliers should provide all but the smallest users[24] with advanced metering services within the next 5 years. This could save around 0.2 MtC by 2020. We will explore with interested parties what further help should be given to organisations to maximise proper use of advanced metering and the savings that can flow from it.

215. The Government will also consider with interested parties what advanced metering services (or other means of providing real time information) might be appropriate for the smallest business users and, if necessary, what might be done to ensure their early deployment in advance of the household sector target date of 2017 (see paragraph 171).

Energy Performance Certificates

216. Along with information on energy usage, businesses require information on how best to invest in energy efficiency. By January 2009, under Article 7 of the Energy Performance of Buildings Directive an Energy Performance Certificate must be produced when buildings are constructed, sold or rented out. These certificates will provide an energy rating (from A to G) for the building and will set out what steps can be taken to improve its energy efficiency. The information will provide an important aid to businesses in meeting their climate change commitments, whether regulatory, such as through the EU-ETS or the new Carbon Reduction Commitment, or voluntary.

217. Whilst those EPCs required on construction, sale or rent will provide accurate information on the energy performance of a Building, which can be used to compare and differentiate between buildings, they will be unable to predict reliably actual in-use energy consumption. This is a function of occupancy, usage and how well a building and its services are being managed. Therefore by January 2009, under Article 7 of the Energy Performance of Buildings Directive a 'Display Energy Certificate' must be displayed in "buildings with a total useful floor area over 1,000m^2 occupied by public authorities and by institutions providing public services to a large number of persons and therefore frequently visited by these persons". These 'Display Energy Certificates' will be developed from actual in-use energy consumption and will reflect how well buildings are being used and managed. This will enable those responsible for the building to assess how well they are managing the asset and this will facilitate the identification of improvement measures.

218. Consideration is being given to increasing the scope of the display certificate requirements to encompass commercial buildings, such as hotels, private banks and retail outlets, as this could help raise public awareness of the importance of energy efficiency. Any decision would be based on practicalities and cost-effectiveness.

219. In Scotland, the requirement to display Energy Performance Certificates for public buildings is planned to come into effect from 2008. The certificate is based on the asset rating of the building and must be publicly displayed within the building.

[24] Below the mandatory half-hourly electricity metering market (that is, those with maximum electricity demand below 100kW or with gas consumption less than 2,500 therms (73.2 GWh), suppliers allocate business customers to six profile classes – 3-8, based on their electricity consumption. Most business customers fall in classes 3 (with a standard "domestic" meter) and 4 (with an Economy 7-type meter). The electricity consumption of these businesses thus closely resembles that of domestic customers.

Labelling

220. The Energy labelling regimes set out in paragraph 165 also provide clear and easily recognisable information for business and public sector consumers about the relative energy consumption and performance of a range of appliances used by business.

Research and Development

221. The Carbon Trust has a range of research and development activities to accelerate the commercialisation of low carbon technologies, both energy efficiency and renewables. This includes:

- **Applied research grants** which provide funding to UK businesses and research institutions to support the development of technologies with the potential to reduce carbon emissions substantially and lead to successful commercial products;
- **Business "incubators"** which support the development of low carbon businesses by providing strategic and business development consultancy, advice on corporate finance, management mentoring, energy-related market research and guidance on technical support; and
- **"Technology accelerators"** which help move low carbon technologies closer to commercialisation by helping to reduce costs and removing barriers to adoption, supporting shared infrastructure or collating data which can be used by industry, Government and other stakeholders.

222. In addition to the work undertaken by the Carbon Trust detailed above, the Energy Technologies Institute is a joint venture which brings together public and private sector R&D in the UK to set strategic direction and fund its delivery. It will provide the UK with a world-class means for delivering energy technology research to underpin eventual deployment. To do so the Institute will connect the best scientists and engineers working in academic and industrial organisations both within the UK and overseas. The projects these teams deliver will accelerate the progress of industrially applicable innovative energy technologies through the innovation chain to enable some commercial deployment within 10 years.

223. The objectives of the Institute are to:

- help address the global challenge of climate change;
- provide a strategic focus in the UK for low carbon energy R&D;
- increase the level of funding in the UK for low carbon energy R&D;
- promote international technology collaboration;
- increase UK R&D capacity; and
- promote people, skills and knowledge sharing.

Some of the world's biggest energy companies are already involved in this unique venture and helping to drive the initiative forward – BP, E.ON UK, Shell, EDF Energy, Rolls-Royce, Caterpillar, and Scottish and Southern Energy Group. Their funding

contribution, matched by Government, provides the Institute with a budget of at least £625million over a lifetime of a minimum of 10 years.

224. The Welsh Energy Research Centre is an independent all Wales collaborative body formed by research groups from the Universities of Cardiff, Swansea, Glamorgan and Bangor, and from the Institute of Grassland and Environmental Research. These groups, which have leading edge expertise in energy related matters, have decided to collaborate on research activities as the Welsh Energy Research Centre.

Building Regulations

225. Part L of the Building Regulations sets minimum energy efficiency standards for new non-domestic buildings in England and Wales and revisions to the Regulations in 2002, 2005 (covering new boilers and windows) and 2006 have significantly improved the energy performance of new non domestic buildings.

226. It is vitally important that new commercial development addresses the new challenges posed by climate change. Following on from the Code for Sustainable Homes, we are keen to start tackling energy efficiency in the commercial sector. We understand that it may be technologically and economically possible for all new non-domestic buildings to achieve substantial reductions in carbon emissions over the next decade and for many to achieve zero carbon on non-process related emissions. Buildings outside of dense urban areas and those with low appliance energy requirements, such as warehouses, distribution centres and some retail outlets, should be able to be built to a zero carbon specification more easily. Other building types may take longer to get there.

227. We are working closely with industry through our task group to learn the lessons from existing exemplars that individual organisations have built, so we can fully understand the costs involved and the barriers to progress. We will use this knowledge to set in place a clear timetable and action plan to deliver substantial reductions in carbon emissions from new commercial buildings within the next 10 years.

228. In Scotland energy efficiency standards and guidance for new non-domestic buildings is detailed in Section 6 of the SBSA Non-domestic Technical Handbook. In addition to energy conservation provisions for the building fabric and building services, a carbon dioxide emissions standard obliges the designer to consider new buildings in a holistic way and consider building-integrated low and zero carbon technologies. The standards and guidance are intended to achieve an improvement of around 23-28% fewer emissions on the previous standards. Taken together with earlier improvements, the improvement in standards should deliver savings of up to 43% , compared with 2002.

229. In March 2007 the Scottish Executive published Scottish Planning Policy (SPP6) making it clear that new developments with a total cumulative floorspace of 500 sq metres or more should incorporate on-site zero and low carbon equipment contributing at least an extra 15% reduction in CO_2 emissions beyond the 2007 Scottish building regulations carbon dioxide emissions standard. The development plan process should be used to consider whether local circumstances justify going beyond 15%; below the 500 sq metres threshold; and whether higher standards can be secured for particular

developments, including the potential for decentralised energy supply systems based on renewable and low-carbon energy. Taken together with the changes to the building regulations, this could reduce CO_2 emissions of many developments by up to 54% compared with 2002.

230. In Northern Ireland**,** energy efficiency standards for new non-domestic buildings are set by Part F of the Building Regulations (Northern Ireland) 2006. These new standards set a target CO_2 emissions rate which is specific to each individual new building and which may not be exceeded. The 2006 standards improve the energy efficiency of new non-domestic buildings by around 40 per cent over the previous 1998 standards with a corresponding 40 per cent reduction in carbon dioxide emissions.

231. The new 2006 Part F requirements represent a major improvement in energy efficiency standards, as for the first time they bring Northern Ireland broadly into line with England and Wales on a similar time scale. The standards are set at a level to encourage a move to the use of low or zero carbon energy sources.

232. In compliance with the Energy Performance of Buildings Directive, the Government is also planning to provide an advice and information programme in relation to the energy performance of boilers, heating systems and air-conditioning systems . This programme will encourage boiler owners in both the household and business sectors to improve the efficiency and reduce the carbon emissions produced by their boilers. We estimate that the effect of this, including the early replacement of boilers brought about by advice could deliver additional savings of up to 0.2 MtC in 2010.

Product standards

233. The polices and measures to raise minimum energy performance standards for appliances described in paragraphs 119 – 131 will also deliver energy savings in the business sector.

Combined Heat and Power (CHP)

The CHP Strategy

234. Good Quality Combined Heat and Power (CHP)[25] has an important role to play in achieving the Government's aims to move the UK towards a thriving, competitive, low-carbon economy. CHP is a carbon-efficient process which utilises the heat produced as a by-product of power generation which would normally be wasted to the environment. It can therefore produce up to 30 per cent fewer emissions than conventional fossil fuel generation.

235. Typically the process is fired by fossil fuels, though biomass CHP is growing in importance. CHP installations vary in size according to their application; from micro-CHP units, an alternative to the domestic boiler, through community schemes generating heat for housing developments and office buildings, to industrial sites equal in size to a medium-sized power station.

[25] Good Quality denotes the output of CHP schemes certified under the UK CHP Quality Assurance programme (CHPQA) as meeting certain energy efficiency criteria. Such schemes are then eligible for the financial benefits listed above.

236. The UK has a target of 10 gigawatts (GW) of installed Good Quality CHP capacity by 2010. In 2005, there was 5.8 GWe of capacity from 1,534 schemes. This provides upward of 7 per cent of electricity generated in the UK and is estimated to save around 4.9 million tonnes of carbon (MtC) per year.

237. The costs of generating electricity using CHP are often higher than for standard centralised generation, even though there is a financial return for the heat that can be sold. In recognition of the carbon savings CHP offers, and to encourage the growth of CHP capacity in the UK, in 2004 the Government published the UK Strategy for Combined Heat and Power[26], which set out the framework for the support of CHP. The Strategy brought together the range of support measures the Government had introduced to help achieve our target of 10GW target. Further support mechanisms have since been implemented as a result of our ongoing commitment to the cost-effective delivery of the Strategy, so that the current incentives for Good Quality CHP include:

- favourable allowance allocations under phase II of the EU ETS;
- exemption from the Climate Change Levy;
- business Rates exemption;
- Enhanced Capital Allowances for plant and equipment; and
- Renewable Obligation Certificate (ROC) eligibility for the biomass element of fuel used in energy from waste plants that utilise CHP.

238. In addition to these measures to make CHP more financially attractive, Government has taken steps to increase awareness of the opportunities for CHP amongst users of heat. Since the publication of the Energy Review, DTI has published the revised guidance for power station developers which includes industrial heat maps. We will work to develop those heat maps with Regional Development Agencies and local authorities.

Sector specific measures

239. In addition to implementing the range of policies set out above that apply equally across the private and public sector there are a number of measures specific to these sectors which are set out below.

Private sector specific measures

Enhanced Capital Allowances

240. The Enhanced Capital Allowance (ECA) scheme for energy-saving technologies was introduced in 2001 as part of the Climate Change Levy package to provide support for business investment in low carbon technologies. It enables businesses to write off the whole cost of an investment in designated energy-saving products against their taxable profits of the period during which the investment was made.

[26] www.defra.gov.uk/environment/energy/chp/pdf/chp-strategy.pdf

241. The scheme is managed by the Carbon Trust on behalf of Government and its criteria are updated annually to reflect the changing market for energy-saving technologies. Initially eight approved technology groups with sub-categories were put in place on the ECA scheme on 1 April 2001. The scheme has expanded in subsequent years and there is now a total of 14 technology groups with sub-categories covering over 14,000 products.

242. By encouraging businesses to invest in energy-saving technologies the ECA scheme not only delivers carbon savings in its own right, but also accelerates the market development of low carbon technologies which are not yet fully commercially sustainable. The Government's discussions with key players suggest that the scheme has provided a significant boost to the market. In particular, it seems clear that sales of energy efficient products have increased as a result, and that manufacturers are increasing their ranges of qualifying products in order to benefit from the increase in demand.

243. Further information on the ECA scheme can be found at its dedicated website at www.eca.gov.uk/etl.

Loans

244. Following the success of its pilot Action Energy Loan scheme, the Carbon Trust has now rolled out an interest-free loans scheme for small or medium-sized enterprises (SMEs)[27]. This provides financial assistance, under the de minimis exemption from EU State Aid rules, to help SMEs acquire and install energy efficient technologies by providing interest free loans of between £5,000 and £100,000 in England and Wales and up to £200,000 in Northern Ireland. Since the scheme began the Trust has offered over 800 loans to SMEs, worth over a total of £30m, saving an estimated 88,000 tonnes CO_2 per annum.

245. There is also a separate scheme in Scotland called Loan Action Scotland which is funded by the Scottish Executive. This scheme has been running since 1999. Operating under similar rules to the Carbon Trust scheme, it has paid over 200 loans worth over £4m up to March 2007 achieving lifetime carbon savings of over 63.000 tonnes (equivalent to 230,000 tonnes of carbon dioxide) and saving Scottish businesses around £12 million.

The Energy End-Use Efficiency and Energy Services Directive

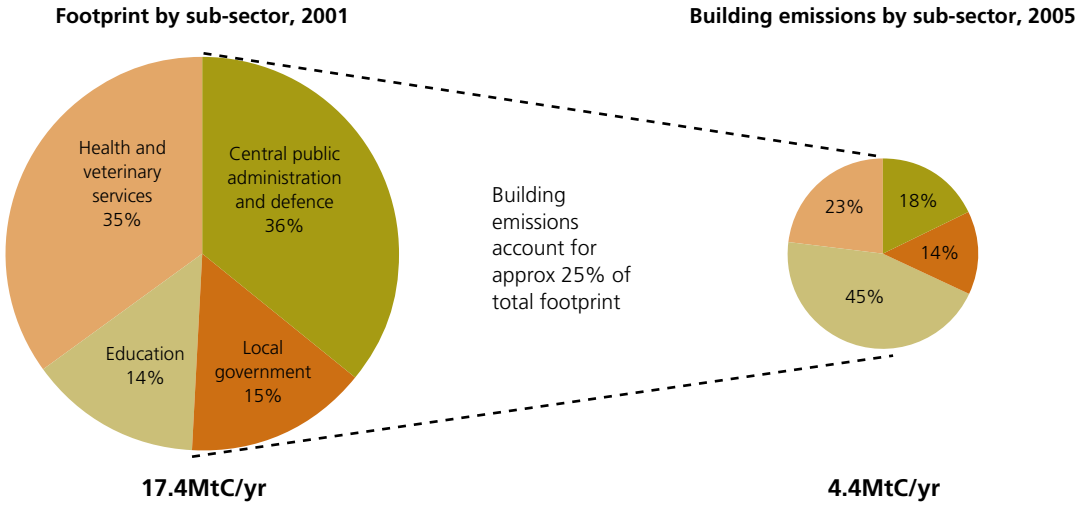
246. The Energy End-Use Efficiency and Energy Services Directive requires Member States to place obligations on energy suppliers to offer and promote either competitively priced energy services, energy audits or other energy efficiency improvement measures to their final customers excluding those covered by the EU-ETS. We will be consulting later this year on options for complying with this requirement in respect of the business customers of energy suppliers.

[27] www.carbontrust.co.uk/energy/takingaction/loans.htm

Public Sector Specific measures

247. The Public Sector is responsible for 8% of UK carbon emissions [28]. Electricity consumption and heating of buildings accounted for approximately 4.4 MtC of emissions in 2005[29] – about 25% of the public sector's total footprint[30] (Figure 3). Reducing these emissions will not only ensure the Government plays its role in addressing climate change but also offers the prospect of better value for money for the taxpayer, through decreased costs and enhanced public service delivery. Government leadership in this area is also critical to the success of the measures targeting action by consumers and business.

Figure 3: Breakdown of public sector carbon impacts across UK



248. The Energy End-Use Efficiency and Energy Services Directive (Article 5) requires the public sector to play an exemplary role in meeting the energy saving target set out in Chapter 2. In addition to the cross sector policies set out above, the policies and measures underway and planned to help fulfil this requirement are detailed below.

[28] Stockholm Environment Institute (SEI)/WWF, 2006, *Counting Consumption*. This uses 2001 emissions data and 2000 input-output tables based on ONS supply-use tables. These figures take account of emissions from transport and carbon imports and exports but do not include MOD operations abroad. These figures are for CO_2 only.

[29] This figure derived from BRE data is for the UK public sector building stock, including higher education establishments. It does not include the embedded carbon in buildings.

[30] 'Carbon footprint' is defined to include: all emissions either generated through on-site heat or power ('direct emissions'), or off-site through electricity use and/or transport use ('indirect emissions'); and 'embedded carbon', that is all carbon associated with the production and delivery of a good or service to the public sector, (such as that generated in the production, delivery and disposal of office paper).

Central Government

Central Government Targets

249. In June 2006, the Government launched stretching targets for sustainable operations on the central Government estate. These targets replaced those in the Framework for Sustainable Development on the Government Estate (originally published between 2002 and 2004) and set out in the 2004 Energy Efficiency Action Plan.

250. The targets include:

Carbon Emissions from Offices

- Reverse the current upward trend in carbon emissions by April 2007;
- reduce carbon emissions by 12.5% by 2010-11, relative to 1999/2000 levels; and
- reduce carbon emissions by 30% by 2020, relative to 1999/2000 levels.

Carbon Emissions from Road Vehicles

- Reduce carbon emissions from road vehicles used for Government administrative operations by 15% by 2010/11, relative to 2005/2006 levels.

Carbon neutral government

- Central Government's office estate to be carbon neutral by 2012.

Energy efficiency

- Departments to increase their energy efficiency per m^2 by 15% by 2010, relative to 1999/2000 levels; and
- Departments to increase their energy efficiency per m^2 by 30% by 2020, relative to 1999/2000 levels.

251. The targets seek to bring the Government estate into line with commitments in the Energy White Paper (2003) and the Climate Change Programme (2006).

252. Carbon neutrality of the Government estate will lead to anual savings of 0.2 MtC in 2020 and be achieved through a package of measures, with a hierarchy of actions starting with reducing emissions and only offsetting what cannot be eliminated. As part of this package, Government has already set itself the target to reduce carbon emissions from its office estate by 30% by 2020.

253. The final step to become carbon neutral is achieved through offsetting the remaining emissions. The Government's scheme will calculate the carbon emissions created by the Government's office-based estate. Those emissions that cannot be eliminated will be offset.

254. Energy is essential to all Government business, from heating and lighting, to transport and communications. Alongside the targets set out above the Government made a commitment that all central Government departments would adopt the Carbon Trust's Carbon Management Programme. By sound sustainable management of its Estate, Government can be seen to implement its own energy policies, such as energy efficiency, and to act as a showcase for best practice.

255. The targets cover all central Government Departments and their Executive Agencies, including buildings and land managed. They also apply to Non-Departmental Public Bodies on a case-by-case basis. They do not apply to the devolved administrations, who have set their own targets, schools, hospitals or overseas locations. Altogether, the central government estate comprises over 50,000 buildings and houses and occupies over 12.5 million m^2 of office space within England, Scotland, and Wales, accommodating some 570,000 civil servants. Progress against the operations targets is assessed by the independent Sustainable Development Commission and reported annually in Sustainable Development in Government Reports.

Northern Ireland

256. In May 2006, the Northern Ireland Sustainable Development Strategy was published. This was followed in November 2006 by a detailed Implementation Plan setting out the approach (until end March 2008) to the delivery of the objectives contained within the Strategy.

257. A central theme of both the Strategy and Implementation Plan is that Government will ensure that the principles of sustainable development underpin its approach to all of the work that it undertakes. Detailed Departmental Action Plans have been produced and they contain very challenging targets for the sustainable management of the office estate. Specifically, with regard to the reduction of greenhouse gas emissions, the Strategy requires the Government estate to be carbon neutral by 2015.

258. It is important to note that these objectives are underpinned by a statutory duty requiring Departments and District Councils to act in the exercise of their functions in the way best calculated to contribute to the achievement of sustainable development in Northern Ireland. Guidance for public authorities on the requirements of this duty is currently being prepared by the Office of the First Minister and Deputy First Minister.

259. The Department of Finance and Personnel manages the Public Sector Energy Campaign which seeks to promote and co-ordinate the efficient use of energy in public bodies in Northern Ireland**.** These organisations occupy about 3500 buildings across Northern Ireland, and spend about £100 million annually on fuels, mainly electricity, oil and natural gas.

260. Northern Ireland Departments (and other public bodies) have been made aware of the objectives contained in the Government White Paper published in 2003 entitled *Our Energy Future – Creating a low carbon economy,* and repeated in the 2006 Climate Change Programme *Tomorrow's Climate, Today's Challenge* (although these are not formally binding on Northern Ireland). All Departments are required to monitor their

energy use and provide annual returns of energy consumption and cost in respect of all buildings which they occupy.

261. Work has been undertaken to benchmark the energy performance of all buildings on the Northern Ireland public sector estate. In order to encourage and monitor progress towards the objectives in the Climate Change Programme, a reporting system has been developed to provide Ministers, senior departmental staff and those with responsibility for managing buildings with information on the energy consumption of the buildings occupied by staff within their areas of responsibility. A similar approach has been adopted by all the Northern Ireland District Councils.

Wales

262. The Welsh Assembly Government has also made a commitment to becoming carbon neutral in its estate.

263. A Carbon Management Project has been established in January 2007 to review the Carbon Footprint of the Welsh Assembly Government's core estate and to bring forward recommendations to reduce the CO_2 emissions in line with the policy statement to achieve a 30% reduction in CO_2e emissions from the administrative estate and business travel from the 2006/7 baseline year and become Carbon Neutral by 2011.

- The Welsh Assembly Government is currently working with the Carbon Trust to develop a 5 stage plan to implement carbon management within the organisation.
- ESD (Energy for Sustainable Development) have undertaken a Scoping Study on its behalf to assess where the Government is now in terms of carbon management and where it aspires to be in relation its core estate and business travel. The Study also presents the rationale and project brief for a full Carbon Management Study and setting out the options to close the gap between the current position and the aspirational position.

Scotland

264. The Scottish Executive recognises that it must lead by example in tackling its own corporate contribution to climate change. The Executive has already taken significant action and has:

- produced a Greening Government policy which sets out objectives and targets for improving environmental performance – including energy consumption, vehicle use, waste and recycling, and the procurement of goods and services;
- delivered major energy efficiency improvements – since 1991 has reduced carbon dioxide emissions due to energy use by almost 50%;
- set a target to reduce carbon dioxide emissions by energy use in its buildings by 30% from 1999/2000 levels by March 2020; and
- committed to participate fully in the Carbon Trust's Carbon Management Programme to help further reduce energy and carbon dioxide emissions savings.

In addition, the Executive will:

- continue to be an exemplar by implementing further energy and carbon savings where possible;
- display energy certificates in all 14 of the target buildings detailed in its annual environmental report (despite only 10 buildings requiring them). This represents around 90% of the Executive's estate (and 94% where the Executive is the major occupier);
- during the summer of 2007 introduce a single carbon dioxide emissions reduction target to cover all activities, including business travel, energy use and waste production; and
- install microgeneration technologies on its own estate. The Executive is currently investigating which of its current buildings are most suitable and will publish further details during 2007.

The Executive reviews and reports on progress being made against meeting these targets and objectives on an annual basis in the Scottish Executive Environmental report.

Scottish Executive Agencies and Non-Departmental Public Bodies

265. The Scottish Executive recently tasked its agencies and non-departmental public bodies (NDPBs) with improving their environmental management practice by putting in place policies, procedures and to set targets for reducing their environmental impact by the end of 2006. Targets include energy consumption, carbon dioxide emissions, waste, biodiversity, transport and travel. Policies and targets will be published and reviewed on an annual basis by each organisation and the Executive will ensure that future targets that are set remain challenging.

266. The Executive estate currently refers solely to the buildings used by the Executive and we intend to widen this definition to include our agencies and NDPBs. This will mean that the environmental performance targets will also apply to our agencies and NDPBS. The Executive will announce how this will be implemented during 2007.

Public Procurement

267. We will also use the power of Government procurement to get better value for money through competition to provide more efficient and sustainable buildings, goods and services. The Government buys goods, services and capital assets to provide better public services and how it does so can make a significant contribution to the achievement of the Sustainable Operations on the Government Estate targets.

268. In 2007, the Government published a report, 'Transforming Government Procurement', which sets out significant changes to the public procurement landscape, and a Sustainable Procurement Action Plan[31] describing what steps it will take to embed sustainability within procurement practice. Local Government and the NHS will be publishing their own plans for sustainable procurement in Summer 2007.

[31] www.sustainable-development.gov.uk/publications/pdf/SustainableProcurementActionPlan.pdf

269. Our goal is for the UK to be among the European Union (EU) leaders in sustainable procurement by 2009, to achieve a low carbon, more resource efficient, public sector. We want to move towards:

- a sustainably built and managed central government estate that minimises carbon emissions, waste and water consumption and increases energy efficiency (in line with Departmental sustainable operations targets);
- sustainably built and managed properties and roads throughout the public sector; and
- Government supply-chains and public services that are increasingly low carbon, low waste and water efficient, which respect biodiversity and deliver our wider sustainable development goals.

270. In Government departments, the focus will be on increasing the level of procurement professionalism, raising the status and standard of procurement practice and ensuring rapid progress towards achieving the targets for Sustainable Operations on the Government Estate.

271. This includes meeting updated and extended mandatory minimum environmental standards (under the label "Quick Wins 2007"). for an increased range of energy-using products. In addition, Government contracts will set out appropriate requirements for suppliers and subcontractors to provide products and services that comply with these standards and we will also promote their use by others in the public and private sectors.

272. Progress against these commitments and the targets for the government estate will be scrutinised and reported on by the Sustainable Development Commission.

273. The combination of measures set out above will have a direct impact on how the Government spends around £60 billion of the £150 billion it spends annually on procurement of goods and services.

274. We are also committed to using our leverage in the property market to transform the markets energy performance by central Government procuring only buildings in the upper quartile of energy performance. In 2006 we launched High Performing Property, this provides the framework and direction for improving strategic property asset planning in central government over a defined period and challenges Government to deliver a a step change in performance. A critical component will be our ability to measure the performance of individual buildings across a range of key performance indicators covering efficiency, effectiveness and environmental sustainability. We estimate the possibility of realising annual savings of 20 per cent by 2013 alongside continuous improvement against sustainability targets.

275. In the Energy White Paper 2007 to ensure the Government leads by example we have set a fleet average car procurement target of 130 CO_2 /km by 2010/11 for new cars purchased by Government and used for administrative operations. We will keep the target under review and look to extend scope of this target following further analysis.

276. In addition, The Government will apply the Code for Sustainable Homes (see paragraph 58) to support housing developments which are under our own control. In particular:

- we will now make it a condition of Government funding that all new homes built by registered social landlords and other developers and all new homes developed by English Partnerships, will comply with level 3 of the Code for Sustainable Homes; and
- the Communities and Local Government Carbon Challenge (Design for Manufacture II) will focus on delivering over 1,000 homes on an initial five sites owned by English Partnerships, achieving near or zero carbon as well as enhanced environmental standards (Level 5 of the Code for Sustainable Homes). It will also take forward the standards of the earlier Design for Manufacture competition.

277. The Welsh Assembly Government has stated its aspiration for all new buildings built in Wales from 2011 onward to be zero carbon and is considering what mechanisms would best support this aspiration, including what role the Code for Sustainable Homes might have in Wales. In the meantime, to underline its commitment to improved standards and to provide an example and constructive challenge to other sectors, BREEAM 'Excellent' or equivalent is being set as a core condition of all Assembly Government funding, grants, investments, joint ventures and land disposals which involve new buildings.

278. In Northern Ireland – The Northern Ireland Sustainable Development Strategy, "First Steps Towards Sustainability", launched in May 2006 set a number of challenging objectives, one of which is to make Northern Ireland public sector a UK regional leader in sustainable procurement.

This Objective has three underlying targets:

- by 2008 ensure that all public sector procurement is channelled through recognised Centres of Procurement Expertise;
- by 2008 ensure that sustainable development principles guide capital investment decisions on all major publicly funded building and infrastructure projects; and
- by 2008 produce a Sustainable Procurement Action Plan for Northern Ireland public sector.

Work is progressing on all three targets.

279. In Scotland, the Executive is also developing a Scottish Sustainable Procurement Action Plan that will build on progress already being made in Scotland and will take into account the work of the UK Sustainable Procurement Task Force and the McClelland report into public procurement in Scotland (see below).The Scottish Action Plan will identify key performance indicators and benchmarking opportunities to deliver on the Executive's ambition to be a leader in this field.

280. As part of the wider Efficient Government initiative, a review of public sector procurement in Scotland was led by Mr John McClelland. The McClelland Report (2006) concluded that:

- a step change in procurement practice is required to achieve targets for future years;
- substantial savings are available from collaboration by buyers, both within specific sectors, (e.g. the NHS, Local Government, etc) and across the public sector at large; and
- "Commodity Centres of Excellence" should be put in place to support collaboration.

One of the recommendations was that corporate and social responsibilities such as sustainability should be part of purchasing policy and practices in every public sector organisation. The Executive is in the process of establishing resources to take forward the various workstreams which have come out of the report. Guidelines on incorporating CSR into procurement for public sector bodies in Scotland will be produced by the end of 2007.

Energy End Use and Energy Services Directive

281. The public sector needs to fulfil an exemplary role in the delivery of the Energy End-Use Efficiency and Energy Services Directive, in doing so it requires Member States to adopt at least two energy efficiency measures from the following list:

- requirements concerning the use of financial instruments for energy savings, including energy performance contracting, that stipulate the delivery of measurable and pre-determined energy savings (including whenever public administrations have outsourced responsibilities);
- requirements to purchase equipment and vehicles based on lists of energy-efficient product specifications of different categories of equipment and, using, where applicable, minimised life-cycle cost analysis or comparable methods to ensure cost effectiveness;
- requirements to purchase equipment that has efficient energy consumption in all modes, including in stand by mode, using, where applicable, minimised life-cycle cost analysis or comparable methods to ensure cost effectiveness;
- requirements to replace or retrofit existing equipment and vehicles;
- requirements to use energy audits and implement the resulting cost-effective recommendations; and
- requirements to purchase or rent energy-efficient buildings or parts thereof, or requirements to replace retrofit purchased or rented buildings or parts thereof in order to render them more energy-efficient.

282. To help facilitate the delivery of the selected energy efficiency measures Government will publish guidelines setting out the criteria for energy efficiency and energy savings to be used by the public sector in its procurement procedures. The Government is currently undertaking analysis of the options and will be consulting with stakeholders later this year. Government will determine which of these requirements will be adopted in the UK by May 2008.

Engagement with Employees

283. Government is also running a campaign for over half a million Civil Servants encouraging them to "Act on CO_2". The campaign will encourage employees to adopt more environmentally-friendly practices in the workplace, and will also promote the CO_2 calculator (developed by Defra in partnership with the Energy Saving Trust, see paragraph 142) as a way for employees to calculate their personal CO_2 footprint. The cross-Government campaign will involve a range of multi-media tools and will target all levels within Government Departments including Permanent Secretaries and procurers.

Salix Revolving Fund

284. Salix Finance Ltd[32] is a private company funded by Government to establish energy efficiency revolving loan schemes in the public sector. The company, a spin-off from the Carbon Trust, is developing innovative approaches to overcome financial barriers in the public sector that currently prevent highly cost-effective measures being adopted.

285. Salix was set up as a £5m pilot in 2005 to work with local authorities, with an additional £20m announced in the Pre-Budget report 2005, increasing funding for 2006-2008 to work with the whole public sector. It provides loans to organisations, which are required to provide match funding and establish an on-going 'ring-fenced' energy efficiency fund. The loans once established continue to deliver energy and emission savings over time, with recycled energy savings split between the revolving fund and released for front-line services.

286. The value of the recycling approach is that the energy costs saved by the projects are fed back into the fund which then supports further projects, which in turn deliver more energy savings and so on. This allows each £ to be used several times over time to generate carbon savings. Financial mechanisms of this type drive change by encouraging procurement managers and decision makers to look again at the way they plan, invest and save within their portfolio giving them real reasons to 'invest to save' for the long term. Not only does this improve environmental and efficiency standards within estates, but it can also stimulate more widespread adoption of energy saving and carbon reduction measures.

287. The current funding for Salix will help support up to 100 public bodies by 2008 and deliver the 0.1MtC that is set out in the Climate Change Programme 2006[33].

288. The Welsh Assembly Government recently announced an additional £450k to supplement Salix activities in Wales and extend the pilot initiatives that have previously been established.

289. The Scottish Executive set up the £20m interest-free revolving scheme called the Central Energy Efficiency fund in 2004 to help public sector bodies reduce their energy consumption and their carbon emissions by investment in energy efficient capital projects. Initially , £15m went to local authorities, £1m to Scottish water and £4m to NHS Scotland. An interim independent evaluation of the local authority scheme in 2006 concluded that the scheme was successful and had already achieved savings of £1.34m

[32] www.salixfinance.co.uk

[33] Assumes £12m allocated by Carbon Trust to Salix Finance Ltd in 2007/08

on implemented projects with a potential to achieve lifetime savings of £104m and 393,000 tonnes of carbon by 2010 if the current rate of progress is maintained.

290. In Northern Ireland, the Department of Finance and Personnel administers the Central Energy Efficiency Fund (currently £2.77 million per annum) which provides financial support for cost effective measures to improve energy efficiency of buildings or reduce emissions to the atmosphere which cannot be funded from within Departments' etc own budgets.

291. Under the Environment and Renewable Energy Fund, an additional £6.5 million has been made available in 2006/07 and 2007/08 to encourage the installation of renewable energy technologies by Government Departments and other public bodies. Beyond this period, this work will be carried forward under the Northern Ireland Sustainable Development Strategy which requires the Government estate to be carbon neutral by 2015.

Carbon Trust Enterprises' Partnerships for Renewables scheme

292. In 2006, Carbon Trust Enterprises Ltd (a subsidiary of the Carbon Trust) launched a new commercial venture "Partnerships for Renewables". With £10m of Government funding over the next two years, the scheme will enable Local Authorities, health trusts and other public sector bodies to work with private sector partners to develop, construct and operate wind and other renewable energy projects on public sector land. It plans to have up to 500MW of renewable energy projects, primarily 3-5MW wind turbine projects, constructed or under development within the next five years. In proving that such projects are commercially viable, the scheme will open up and fast track the development of a new market for renewable power worth an estimated £3-5 billion. More details of the initiative can be found on the Trust's website[34].

The National Health Service

293. The NHS has the largest property portfolio in Europe and the biggest capital spend programme with an annual revenue budget over £76bn. The NHS employs over one million people and spends £11bn per year on goods and services. Tasked with building new hospitals, and GP premises, it expects to spend £12bn on new facilities by 2010. Energy use costs the NHS over £433m per year and is responsible for emissions of nearly 1 MtC each year.

294. The NHS has two energy efficiency targets for England and Wales:

- to reduce the level of primary energy consumption by 15 per cent or 0.15 MtC, from a base year of March 2000, by March 2010; and
- to achieve a target of 35-55 Gj/100m^3 energy efficiency performance for the healthcare estate for all new capital developments and major redevelopments or refurbishments; and that all existing facilities should achieve a target of 55-65 Gj/100m^3.

[34] www.carbontrust.co.uk/commercial/enterprises/pfr.htm

295. Data up to 2004-05 demonstrates that the energy efficiency of the NHS estate in England continues to improve relative to occupied floor area. If this trend continues, predictions show that total energy consumption is likely to reduce by 15 per cent from 2000 figures by 2010. Predictions indicate that this performance is likely to continue with higher building standards and greater elements of the future estate comprising more local low-tech facilities and fewer, but more efficient, high-tech acute facilities. Carbon dioxide emissions are not reducing to the same extent but it is anticipated this will improve with the impact of the forthcoming revised Building Regulations and the Energy Performance of Buildings Directive and the further development of renewable energy sources.

296. In January 2007 the Government announced £100m funding to help the NHS in England make further energy savings. The funding will help NHS organisations put in place improvements in electrical efficiency, building insulation, combined heat and power installations, and contribute to the Government's Climate Change Programme. Savings made will be available for reinvestment into patient care.

297. In accordance with the Government's Sustainable Construction Action Plan, we produced the NHS bespoke BREEAM tool, NHS Environmental Assessment Tool (NEAT). Since 2002 it has been a requirement for all NHS capital development schemes to achieve a NEAT score of Excellent for new builds or Very Good for refurbishments. NEAT is currently under significant redevelopment to keep pace with legislation and changing standards and will be reissued as BREEAM for Healthcare. The new tool will be an accredited process and will form part of a whole new training and awareness initiative for the NHS and its partners.

298. The Government has provided research monies towards developing a learning network for sustainable healthcare buildings 'SHINE'. SHINE aims to help NHS trusts improve the sustainability and energy/carbon efficiency of their buildings by providing a learning network with guidance, case studies, events and training, covering all aspects of sustainable buildings and how they can be delivered through NHS procurement processes. The Government has also issued 'Encode – making energy work in healthcare' that provides comprehensive guidance on energy awareness, surveys, energy savings measures and monitoring along with related sustainability issues.

299. NHS Purchasing and Supply Agency has established national framework contracts for energy and estates that provide access to energy auditing and assessment services and products that meet or exceed 'Quick Wins' standards.

300. A major review of estates contracts will take place over the coming year in conjunction with the Office for Government Commerce that will incorporate a strong focus on making energy and carbon efficient products and technologies available, at cost effective rates, to the health care sector and wider public sector.

301. Consideration of the energy performance of equipment is already embedded within purchasing procedures linking in with 'whole life cost' assessment and work is underway to improve tools, training and approaches to support this.

302. For the NHS in Wales, the latest figures indicate a 6.5% reduction in net energy use and a 16% improvement in efficiency using the NHS performance indicator from a 1999/2000 baseline.

303. To continue to improve performance the NHS in Wales has introduced a central energy fund. The allocation of monies to Trusts from this fund is based on approved Trust energy emissions reduction plans for a three-year period starting in 2006/07. A total sum of £3.1m has been allocated which it is estimated will save 0.004 MtC annually.

304. In Scotland, each NHS Scotland body must have in place local policies for property management, environmental management, construction procurement and design quality that adhere to the Executive's sustainable development objectives and that include targets for reducing energy consumption and greenhouse gas emissions.

305. Over the 19 year period to 2004/05, NHS Scotland has made a significant achievement, it has:

- reduced energy consumption by around 36%; and
- reduced carbon dioxide emissions by nearly 39%.

NHS Scotland continues to pursue energy efficiency and has set a national target to further reduce energy consumption by 2% each year until 2010. This represents a total saving of almost 50% in energy consumption by 2010 over 1990 levels.

Education

306. The education sector accounts for approximately 14% of the emissions from public sector buildings.

307. A recent scoping study into the carbon footprint of schools estimated that the energy used within schools buildings results in emissions of approximately 5Mt CO_2 per annum.

308. Annual energy returns from schools, collected by the Government for the period 1999-00 to 2002-03, show that there has been a substantial increase in electricity consumption over this period as the use of information and communications technologies and extended opening hours have both increased.

309. As part of the DfES capital programme, a large number of schools will be either rebuilt or refurbished over the next 15 years: Building Schools for the Future (BSF) will rebuild or refurbish all secondary schools in England; the Primary Capital Programme will similarly address 50% of primary schools in England. The target energy performance for these schools is currently set at the upper quartile for all schools, which represents an improvement of around 20% on current median consumption levels. Greater use of renewable energy technologies in schools has the potential to further reduce carbon emissions from the schools estate.

310. In April 2007, the Government adopted a Sustainable Schools Action Plan which highlights the practical action Government will take to ensure that schools in England have all the support they need to become models of sustainable development for young people and their communities by 2020. The Action Plan announced that by September 2007, we will set out targets for the environmental performance of the schools estate, and explain how our capital funding and support will contribute to achieving them. The Government has announced additional funding of £110 million to be invested during 2008-11 to trial measures to reduce carbon emissions from school buildings to allow all new schools in England to be carbon neutral.

311. All new schools within the DfES capital programme (which includes City Academies and schools procured through BSF, along with schools that are funded from capital which is delegated to local education authorities) are required to register for a BREEAM assessment and aim to achieve a target rating of 'very good' or better. A large proportion of the 'credits' that are available through a BREEAM school assessment are awarded through measures to reduce energy use through passive features of building design, energy efficiency, and the use of renewable energy.

312. Higher education institutions also have a significant impact on the environment. Each year they are responsible for consuming 7.7 billion kWh of energy at a cost of over £300m and spend £5bn on goods and services. They educate two million students and employ almost 300,000 staff, and have an opportunity to support a sustainable society by equipping students with the values, skills and knowledge to contribute to sustainable development. They also have the opportunity to generate and transfer knowledge through research and influence on, local, national and international networks.

313. The Higher Education Funding Council for England (HEFCE) provides grants to institutions through their Leadership, Governance and Management Fund to support the development and promotion of good practice. In July 2005 HEFCE published a strategy and action plan, setting out how, within the next ten years, the Higher education sector in England will achieve sustainability and tackle climate change. This is a key cross-cutting theme of HEFCE's strategic plan for 2006-11.

314. The Learning and Skills Council (LSC) is responsible for leading and embedding sustainable development in the post 16 learning and skills (further education) sector. In September 2005, it published 'From Here to Sustainability' – a ten-year plan to help and guide the sector in committing and contributing to sustainable development, supported through the LSC's overarching funding and planning remit. As a key part of this, the LSC's recent national capital prospectus states that, in future, to qualify for LSC capital funds, all proposals will need to address sustainable development by a series of measures, including:

- meeting, and preferably exceeding, the requirements of Part L of the Building Regulations;
- ensuring that the completed development meets the criteria to reach excellent Building Research Establishment Environmental Assessment Method (BREEAM) ratings;
- maximising the use of natural lighting and ventilation by using wind and solar power to generate light and heat and rainwater to reduce water usage; and

- embedding the principles of sustainability in the design of buildings and building systems.

315. In "The Learning Country: Vision into Action" the Welsh Assembly Government stipulates that when making all school buildings fit for purpose, we will 'promote sustainability and security in the design of new schools and significant refurbishments by requiring local authorities to have regard to the BREEAM standards and to incorporate sprinklers when using Assembly Government grant'. BREEAM 'Excellent' or equivalent is being set as a core condition of all Assembly Government funded new school buildings.

316. In Scotland, one of the Executive's main priorities is to modernise the school estate with well designed, well built and well managed schools. The Executive provides extensive funding to local authorities to support investment in school buildings in the form of revenue support for Public Private Partnership (PPP) projects, loan charges support for conventional borrowing and capital grants.

317. Sustainability is a key aspect when considering the whole life costs of a building. It is not just the initial purchase price of an asset but consideration must be given to the ongoing running and maintenance costs. This is a key feature of PPP contracts but should also be considered under conventional procurement. This provides the opportunity to demonstrate better value for money and to deliver public services in a more environmentally sensitive way, including being more energy efficient.

318. The Executive is already encouraging greater energy efficiency for schools – the Schools Fund Capital Grant for 2006-07 was enhanced by a further £30 million, with energy efficiency being a key focus for the additional monies.

319. In addition, the Scottish Executive has also committed a further £4 million for the expansion of the Central Energy Efficiency Fund, an interest free revolving loan fund, for the Further and Higher Education Sector in Scotland.

Local and Regional Government

320. Local authorities are uniquely placed to provide leadership and vision to local communities, raise awareness of energy efficiency and help change behaviour. In addition, through their responsibilities (housing, planning, local transport, powers to promote well-being and through their procurement of goods and services and their own operations.

321. We have put in place a number of measures to promote regional and local energy efficiency activity.

Regional Development Agencies

322. The RDAs have an important role to play in tackling climate change through their energy strategies. These strategies include:

- maximising UK business opportunities that arise through sector and supply chain support, and promoting business energy and resource efficiency;

- supporting the deployment of essential energy infrastructure and skills at a local and regional level; and
- supporting low carbon innovation, through support for research, demonstration of new and emerging energy technologies.

RDA Delivery

Since 2003, RDAs and the regional energy agencies they support, have worked with key regional partners to:

- commit £59m to supporting the development, demonstration and commercialisation of new energy technologies;
- generate £52m in income for UK companies by helping them to identify and exploit new supply chain opportunities for supporting energy sector companies;
- offer advice to 11,000 small businesses on energy efficiency; and
- support 220 new business and housing developments to set standards for energy efficiency and carbon emissions significantly above national building regulations.

323. The Government recognises that RDAs are the leading strategic body on energy in the regions, within the context of their overarching responsibility for economic and sustainable development. As part of their role RDAs have committed to:

- set carbon reduction targets in their corporate plans; publish an estimate of the carbon they expect to save from their policies and programmes by 2010 and 2020; and update these estimates at least annually as they develop new programmes;
- set out by December 2007, which energy technologies they intend to prioritise and support over the next 10 years. This will give a clear steer to companies and potential investors and encourage partnership working between the RDAs and research and innovation organisations, including the new Energy Technologies Institute[35];
- identify energy supply chain opportunities and set out priorities for promotion and support (by December 2007);
- support small and medium-sized businesses on energy efficiency, piloting in 2007-08 a streamlined business resource efficiency advice service through Business Link (also co-ordinated through the Business Support Simplification Programme) which will include working with a range of business support providers including the Carbon Trust and other, the bodies through the Business Resource Efficiency and Waste Programme (BREW);

[35] http://www.dti.gov.uk/files/file34010.pdf

- work with Sector Skills Councils and Regional Skill Partnerships to develop programmes to support the development of key energy skills, including:
  - engineering, project management and heavy construction;
  - operation and maintenance;
  - key suppliers and service providers to the energy sector;
  - areas necessary to facilitate the move towards zero carbon development – including sustainable construction, the installation of energy efficiency and microgeneration technologies, and the project management/ legal skills necessary for the establishment of Energy Services Companies (ESCOs);
- ensure all regeneration projects (from December 2007) and other developments for which RDAs provide funding or land meet carbon emissions standards significantly in advance of those required by Building Regulations (e.g. at least 10 BRE Environmental Assessment Method (BREEAM) carbon credits). This includes commercial developments not covered by the Code for Sustainable Homes; and
- play a key role in advocacy for the development of critical energy infrastructure and provide support through monitoring and advice on strategic proposals.

324. With their detailed knowledge of existing and likely locations for new development in the regions, RDAs are ideally placed to identify opportunities to exploit the sustainable use of heat. They are key consultees in the revised guidance on CHP for developers considering proposals for new large-scale power stations under Section 36 of the Electricity Act. New power station developers will be signposted to seek advice from RDAs on potential customers for heat when considering the viability of heat recovery in new power plants.

325. RDAs are also well placed to pilot focussed approaches to financing and managing the sustainable production and delivery of energy, for example through local ESCOs.

326. Where appropriate, RDAs will develop Community Energy Solutions (CES) companies like those currently being piloted in the North East and Yorkshire and Humber. These develop and deliver projects that bring together gas network extensions, energy efficiency installations, advice on benefits and small-scale renewables in communities with a high incidence of fuel poverty.

Local Authorities

327. Local authorities have a growing role to play in helping to meet the UK's energy policy goals by leading carbon emissions reduction in their communities. The Energy Saving Trust works with local authorities to develop and implement sustainable energy strategies, through dedicated specialist support and training, and a national web and telephone technical advice service.

328. The Government is also working with England's core cities[36] (Birmingham, Bristol, Leeds, Liverpool, Manchester, Newcastle, Nottingham and Sheffield) to develop a joint statement or declaration on climate change. This will build on the Nottingham Declaration[37], which has now been signed by over 200 local authorities and commits them to develop plans with their partners and local communities to progressively address the causes and the impacts of climate change and achieve a significant reduction of greenhouse gas emissions from their own authority's operations.

329. The Local Government White Paper 2006[38] set out proposals for a new Local Government Performance Framework, which will strengthen this role to help meet the commitments made in the 2006 Climate Change Programme. This framework will cover climate change, while the 2007 Comprehensive Spending Review will make decisions on national outcomes, indicators and national targets.

330. To help local authorities to tackle climate change the seven 'sustainable energy' beacon authorities[39] have created a draft benchmark and an interactive toolkit. These will help councils to evaluate their own performance and provide guidance for improvement. Twenty one councils took part in a pilot programme to test the format. Analysis from the pilot will inform any adjustments to the toolkit before it is launched nationally later this year. Ministers agreed a new "Tackling Climate Change" theme for 2007, covering both reducing greenhouse gas emissions and adapting to the impacts of climate change, for round 9 of the beacon scheme.

331. The Climate Change and Sustainable Energy Act 2006 commits the Government to producing an 'energy measures report' by August 2007 and that local authorities in England and Wales will have to 'have regard' to it when exercising their functions. The report will contain information on measures that local authorities can take in order to:

- improve energy efficiency;
- increase the levels of microgeneration;
- reduce greenhouse gas emissions; and
- reduce the number of households living in fuel poverty.

332. In 2006 the Welsh Assembly Government and Welsh Local Government Association launched the Welsh Declaration on Climate Change. All Local Authorities in Wales, some National Parks, Fire Authorities and Police Authorities have signed up to the declaration.

333. The Assembly Government introduced energy efficiency targets into the most recent round of Policy Agreements negotiated with Local Authorities. The Assembly Government is taking forward with its Welsh public service partners, the development of a new performance framework for Wales. This will include the establishment of Local Service Boards and the development of Local Service Agreements between the Boards and the Government.

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[36] www.corecities.com/ for more information on the core cities

[37] www.est.org.uk/housingbuildings/localauthorities/NottinghamDeclaration/

[38] www.communities.gov.uk/index.asp?id=1503999

[39] www.idea-knowledge.gov.uk/idk/core/page.do?pageId=5098472

334. The Welsh Assembly Government is currently working with local authorities, the NHS and other local public service partners to test a new model of Local Service Boards, designed to strengthen the leadership, and the managerial capacity, of the local public service delivery system to collaborate effectively on delivering strategic priorities, including sustainability and efficiency across sectors.

335. The first Local Service Board development projects are underway and include two local partnerships that have identified addressing climate change as part of their plans. We will be learning from them how to deliver effective collaborative action on climate change and measure its impact.

336. Local Government is Scotland's largest public sector employer and therefore has a critical role to play in taking action to combat climate change through both its own local activities and its influence on the wider community.

337. Local authorities have committed to demonstrating that leadership and taking action through the Scottish Climate Change Declaration. The declaration was launched early in 2007 and has energy efficiency as one of its key actions. Councils have signed up to:

"Produce and publicly declare a plan, with targets and time-scales, to achieve a significant reduction in greenhouse gas emissions from our own operations. This will include our energy sourcing and use, travel and transportation, waste production and disposal, estate management, procurement of goods and services and through improved staff awareness"

The Executive will continue to support local authorities in meeting their commitments in the long term. For example, the Executive:

- has provided resources to assist the Sustainable Scotland Network (SSN) develop a climate change programme for local government in Scotland. This programme, which will be in place by the end of 2007, will co-ordinate and strengthen the wide range of activity taking place at local authority level and set the strategic framework and direction for future action;
- supports the network of energy officers from all 32 Scottish Local Authorities to help them to reduce energy consumption and carbon dioxide emissions by sharing best practice, to benchmark energy data and to move quickly on the introduction of new and improved energy efficient and renewable technologies;
- will continue to work with COSLA, the Sustainable Scotland Network, the local authorities and other partners to ensure the right information and guidance is in place; and
- will work with the local authorities and other partners to develop a simple and practical way for local authorities to monitor and report greenhouse gas emissions and to use this information for benchmarking and setting targets for reducing emissions.

Arrangements in London – a Climate Change Duty for the Greater London Authority (GLA)

338. As a large metropolitan area and a major energy consumer, London plays an active role in tackling climate change issues. The Government has introduced, in the new GLA Bill announced in the Queen's speech of 15 November 2006 and currently before Parliament, a duty on the Mayor of London and the Assembly to address climate change, including both mitigation and adaptation policies.. This will ensure that the GLA continues to take action beyond the term of a particular Mayor or administration.

339. The Mayor will prepare a climate change mitigation and energy strategy that must take into account and assist with the implementation of Government policies on energy and climate change mitigation. The strategy will also contain the Mayor's proposals relating to minimising carbon dioxide emissions from surface transport and the use of energy more broadly; supporting technological innovation; and promoting the efficient production and use of energy.

Action taken by the GLA to address climate change mitigation and energy

340. The Mayor has developed a Climate Change Action Plan for London[40]. This plan focuses on how London can deliver the most significant CO_2 savings at lowest cost. The plan is centred on four programmes: Green Homes, Green Organisations, Green Energy and Green Transport, and also includes actions for the GLA family (GLA, TfL, Metropolitan Police Authority, the London Development Agency and the London Fire and Emergency Planning Authority).

341. The London Energy Partnership[41], set up by the Mayor to respond to the challenges of climate change, security of energy supply and fuel poverty, has recently published the following reports on its website: "Towards Zero Carbon Development – Supportive Information for Boroughs"; "Making ESCOs work"; "Skills for a Low Carbon London"; and "London Carbon Scenarios to 2026".

342. The Mayor launched the London Climate Change Agency (LCCA) in 2005 to action projects in areas with a strong bearing on climate change, especially energy, transport, waste and water. It has implemented renewable energy projects at the London Transport Museum, Palestra and City Hall, as well as setting-up a joint venture energy services company -London ESCo. The LCCA and the London ESCo will deliver major Combined Cooling, Heat and Power (CCHP) projects across London, and implement both large and small scale renewable energy projects.

343. The London Hydrogen Partnership[42] was launched in April 2002. The Partnership provides a platform for funding bids and the initiation of projects to create conditions where these technologies can thrive.

344. The GLA, LDA and Defra are funding the prototype phase of a Green Homes "Concierge Service" for London. This will trial, in 40 London homes, the provision of auditing, commissioning and installation support for owner occupiers seeking to improve the energy efficiency and renewable energy generation of their homes.

[40] To follow

[41] www.lep.org.uk

[42] www.lhp.org.uk

Transport Sector

Summary of measures

To improve energy efficiency in the transport sector we:

- have pressed for aviation to be included in the EU ETS, and are currently negotiating with other member states on legislation for its inclusion, and have launched a public consultation to help inform our position. We are also working with the ICAO and the UN to develop a global solution for what is a global problem;
- will continue to investigate the possibility of including surface transport in the EU ETS;
- have reformed both vehicle excise duty and company car tax so that they now are graduated to reflect the CO2 emissions from cars, with lower rates for fuel efficient vehicles, and increases in rates for the least efficient;
- are undertaking analysis of the European Commission proposals to create mandatory fuel efficiency targets for cars;
- are funding innovation in the low carbon transport industry through the Energy Technologies institute and will finance a new Low Carbon Vehicle Innovation Platform aimed at accelerating UK technology research that the market may not have carried out; and
- will develop a new programme of public sector procurement to deliver value for money and promote and support low carbon vehicle development, increasing the visibility and certainty of an early market for new lower carbon vehicles, reducing the risks faced by companies when considering whether to introduce a new technology to the marketplace.

To communicate the importance of energy efficient travel we:

- are putting record amounts of investment into public transport to give people a real alternative to using their car. The UK now has the fastest growing railway in Europe and the highest number of rail passengers in 40 years and local and central Government are now spending about £5 billion a year to provide bus services;
- have put in place a substantial programme to promote changes towards more sustainable patterns of travel behaviour through Smarter Choices. These include local authority 5 year Local Transport Plans (LTPs), a Travelling to School Initiative, the "walking bus" scheme and the promotion of workplace, residential and personalised travel planning. The Government also has a continuing commitment to promoting active travel and doubled the budget of Cycling England in 2006;
- provided funding in Scotland to Regional Transport Partnerships for SMART measures, core funding goes to Cycling Scotland and project funding goes to Sustrans for the National Cycle Network and local links. Funding is also provided to Scottish local authorities to tackle the 'school run' and for walking and cycling infrastructure;
- have launched a consumer facing communications strategy reinforcing the colour coded vehicle efficiency labels, smarter driving and will launch a service that compares the carbon impact of different travel modes;

Summary of measures (continued)

- fund the work of the EST, which offers a green fleet review for operators of small fleets of vehicles and also provides advice on travel plans and undertakes eco-driving campaigns; and
- are developing in Scotland, a 'carbon balance sheet' to assess the impact of all Scottish transport policies and measures.

Summary of energy savings

Policy	Expected energy and carbon savings in 2010		Expected energy and carbon savings in 2016		Expected energy and carbon savings in 2020	
	TWh	MtC	TWh	MtC	TWh	MtC
Voluntary Agreement Package, including reform of company car taxation and graduated Vehicle Excise Duty	34.1	2.3	45.5	3.2	48.0	3.5
Future Agreements (2)	1.0	0.1	10.6	0.7	25.7	1.8
Local Authorities Policies	2.7	0.2	3.0	0.2	3.0	0.2
TOTAL TRANSPORT SECTOR	**37.8**	**2.6**	**59.1**	**4.1**	**76.7**	**5.5**

Notes:

(1) Annex A gives further information on the methods used to estimate likely energy and emissions savings, the methods used to measure savings from past measures.

(2) These savings are relative to the counterfactual which assumes there are no efficiency savings from the Voluntary agreement from 2008 onwards. They do not take into account the effect of the initial voluntary agreement.

345. The transport sector accounts for around a quarter of UK domestic energy use and emissions of CO_2. The majority of transport greenhouse gas emissions (93%) come from road vehicles.

346. If we are to deliver energy savings in the transport sector we need to bring about smarter, more energy efficient use of transport, changes in the types of vehicles, fuels and travel modes we use, for example by increasing investment in public transport and improvements in vehicle efficiency by establishing frameworks which provide market signals and information to secure a fundamental shift towards more environmentally friendly and efficient transport.

347. This framework includes the application of carbon pricing mechanisms in the transport sector through a variety of means: taxation, trading and regulation, promotion of technological development and encouraging behavioural change. We must recognise, however, that the challenge of addressing emissions from the transport sector is a global one and that transport services, vehicles and fuels are internationally traded goods. However, if we are to make an effective case for international action we must show leadership through our domestic policies.

Carbon Pricing

348. The Eddington Study[43], 'Transport's role in sustaining UK's Productivity and Competitiveness: The Case for Action', supported pricing carbon into transport decisions to incentivise greater energy efficiency. The Government will look to use carbon pricing mechanisms across all modes of transport through a variety of means: trading, taxation and regulation.

Aviation and the EU Emissions Trading Scheme

349. The Government recognises that for an international industry such as aviation, a global solution is required to tackle the climate change impacts. As a result, the Government believes that the best way for aviation to contribute to the goal of emissions reduction is through a well designed, international emissions trading scheme. This will ensure that emissions reductions take place in as cost-effective a manner as possible including allowing for emissions reductions to take place within the sector or through the aviation sector paying other sectors for reductions they have made.

350. The UK plays a leading role in the International Civil Aviation Organisation (ICAO) to find ways of minimising the adverse impact of aircraft emissions. However, overall progress at a global level has been too slow, so in the meantime progress has been made within the EU on including aviation in the existing EU emissions trading scheme (EU ETS)

351. In December 2006 the European Commission published its legislative proposal to include aviation in the existing EU ETS. The Government welcomed this proposal and continues to actively support the debate in Europe on aviation's incorporation into the EU ETS. We hope to ensure its inclusion in a robust and environmentally-efficient scheme as soon as possible.

352. At the beginning of 2007, we began negotiating with other Member States on the details of the legislation. To help inform our position, we launched a public consultation in March 2007 and we continue to consult with industry and international partners as the negotiations progress. Once the legislation has been adopted, we will use our influence to ensure it is implemented appropriately and that the necessary monitoring and reporting structures are in place.

353. As an illustrative example of the potential for carbon savings, the Commission's impact assessment for the proposal estimated, based on stabilisation of aviation emissions at 2005 levels, that the annual EU-wide carbon savings could be between 12-50 MtC, depending on the scope of the scheme, compared to business as usual emissions levels in 2020.

354. Currently, emissions from international aviation and shipping are not counted in the national inventories of greenhouse gas emissions as there is no international agreement on ways of allocating such emissions to individual states. We are working toward agreement in the UN on how to allocate these emissions but ultimately these growing sectors only serve to emphasise the importance of international action to such an inherently global industry.

[43] www.dft.gov.uk/about/strategy/eddingtonstudy/

Surface transport and the EU-ETS

355. The 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. The EU ETS is currently being reviewed by the European Commission and the Government has been working hard to encourage the Commission and other Member States to consider the inclusion of surface transport.

356. The Government believes that the inclusion of road transport in the EU ETS could potentially be a cost effective means of delivering significant carbon savings. This could be done in different ways, but one approach would be to require fuel producers to hold carbon allowances to cover the total amount of CO_2 emissions resulting from the fuel they sell. The benefits in terms of carbon savings would be highly dependent on a number of assumptions, not least the levels of CO_2 allowance allocation to the road transport sector. The tighter the cap on allowances allocated to the transport sector, the greater the carbon savings but also the higher the costs.

357. We will be carrying out detailed analysis of this approach, including further consideration of the potential impacts on UK competitiveness and the price of carbon allowances. The carbon savings arising from the inclusion of road transport would depend on the number of allowances allocated to the transport sector. For instance, analysis undertaken for the Energy White Paper suggests that if the cap was allocated on the basis of a 2-5% under allocation to the transport sector, this could save in the region of 1-2 MtC in 2020. In taking this work forward we have re-affirmed in the Energy White Paper that an EU-wide approach is preferred to reduce emissions from surface transport.

Fiscal Instruments

358. Vehicle Excise Duty (VED) was reformed so that from March 2001 it became graduated by carbon emissions. In Budget 2006 the graduated VED banding system was changed, reducing the duty for the lowest emission cars to zero and increasing the duty for the highest emissions cars to £215. The UK's VED structure has been recognised by others as a template to follow to increase the fuel efficiency of cars with recent announcements by both the German and Portuguese Governments on their intention to re-structure their equivalent VED taxes to reflect the CO_2 of vehicles.

359. In this year's Budget we announced further measures in support of the Government's objective to address the issue of fuel efficiency in cars by increasing vehicle excise duty for the most polluting cars (graduated VED band G) to £300 this year, rising to £400 next year and cutting vehicle excise duty for graduated VED band B cars to £35 per year.

360. In 2002, Company Car Tax was reformed to make it carbon-based. It is estimated that this, along with the changes to the VED saved 200,000 to 300,000 tonnes of carbon in 2005 – and it is expected to save up to 0.65MtC in 2010. The company car tax fuel benefit charge was also reformed in 2003, and the Government published, alongside

Budget 2006, a consultation on capital allowances for new business cars, including options to introduce a range of first year allowances for cars depending on carbon emissions.

361. To further promote environmentally friendly vehicles, Budget 2006 announced that the threshold for the minimum percentage charge rate for calculating the company car tax benefit in kind will be reduced from 140g CO_2/km to 135g CO_2/km in 2008-09. A new rate of 10% for cars of 120g CO_2 and below will also be introduced from 2008-09.

362. We also announced in the 2007 Budget a rise in fuel duty by 2 pence per litre from October 2007 this year, to be followed by a 2 pence per litre increase in 2008 , and a 1.84 pence per litre increase in 2009.

Improving the Efficiency of Vehicles

363. The Government recognises the need to provide clear market signals that incentivise industry to innovate and develop more environmentally friendly transport technology. Given the international nature of the automotive industry our focus is to drive change through the EU.

364. To do this the Government has been committed to the Voluntary Agreements on new car fuel efficiency between the European Commission and the automotive industry, which have aimed to improve the average fuel efficiency of new cars sold in the EU by 25 per cent by 2008-9 against a 1995 baseline.

365. We have seen steady progress in improving the average fuel efficiency of new cars sold in the UK. New cars sold in the UK in 2004 were on average some 10 per cent more fuel-efficient than in 1997. The rate of progress has slowed in recent years, however, and new cars sold in 2005 were only 0.9 per cent more fuel efficient on average than new cars sold in 2004.

366. The current EU voluntary agreements are due to expire in 2008/9, and in September 2006 the Government published a discussion paper on policy options to replace the Voluntary Agreements. Whilst the responses broadly recognised the progress made so far, concern was raised about the slowing rate of this progress and the likelihood of the targets not being met. There was therefore considerable support for moving to a mandatory system to replace the current CO2 Voluntary Agreements. It also pointed to further issues that need resolving before a final decision could be agreed, for example potential costs, possible benefits of trading and the way fuel efficiency targets are structured.

367. In February 2007, the European Commission published a Communication on the review of the Community Strategy to reduce CO_2 emissions from passenger cars and vans[44]. The Communication confirmed that the Commission would bring forward a legislative proposal to reach an average new car fuel efficiency target of 130 grams of CO_2 per kilometre (gCO_2/km) by 2012. Further carbon savings are to be delivered by a range of other measures, leading to an overall target of 120gCO_2/km by 2012.

[44] europa.eu/rapid/pressReleasesAction.do?reference=IP/07/155

368. The Government welcomed the Commission's intention to bring forward a legislative framework and supports the Commission's proposals to more demanding mandatory fuel efficiency targets, subject to understanding how the targets will be implemented and subsequent impact assessment. However it is our view that the proposals should also set out a longer-term strategy for improving vehicle fuel efficiency. The Government announced in Budget 2007 that its longer-term objective is that average new car emissions be reduced to 100gCO_2/km.

369. As a step towards this further work, the Government believes it is essential that the legislative framework enshrines certain key principles:

- **Clarity and accountability** so all parties are clear what is required to ensure effective delivery and monitoring;
- **Cost effectiveness** – different regulatory approaches on fuel efficiency will have different costs and benefits. Greater flexibility will often ensure greater cost-effectiveness;
- **Environmental effectiveness** to ensure achievement of the stated environmental objectives;
- **Comprehensive scope,** by applying to all new vehicles sold in the EU regardless of place of manufacture, and also seeking to ensure further progress in fuel efficiency across all market segments; and
- **Proportionality** via thorough impact assessment to underpin the legislative mechanism development process, with particular attention given to setting appropriate targets and timescales.

We will continue to work with the Commission, other Member States and all interested parties with the objective of securing a Europe-wide regulatory regime that is compatible with these principles. We are optimistic that a satisfactory framework will be delivered. Our analysis suggests that in the UK we could save 1.8-4.1MtC per year by 2020, depending on the extent of fuel efficiency improvements we achieve.

370. This has the potential to be one of the Government's biggest interventions to tackle transport emissions. We will therefore push for an ambitious and realistic long-term target that recognises the importance of tackling climate change and of giving industry a clear signal to develop and implement new technologies.

371. To achieve the kind of fuel efficiency improvement outlined above will require considerable innovation. The private sector will need to sustain and enhance its investment in vehicle technologies to improve their environmental performance, Government needs to provide the frameworks that support and stimulate this investment, as well as encouraging a successful entry to market of low carbon technology.

Promoting Innovation

Low Carbon Transport Innovation Strategy

372. The Low Carbon Transport Innovation Strategy (LCTIS) published in May 2007[45] sets out a wide range of actions Government is taking to encourage innovation and technology development in lower carbon transport technologies.

373. Industry already spends a great deal on Research and Development. For example the big auto manufacturers spend several billion dollars per year. However only a small proportion of this goes on riskier, less developed low carbon R&D. A key role for Government is to stimulate investment in a broad range of R&D activities, including nearer and further from market options. Essential to this will be the use of regulatory frameworks such as carbon pricing and energy efficiency, but also Government funding aimed at accelerating the development and market penetration of new lower carbon technologies.

374. As a result of the low carbon transport innovation strategy and to help ensure development of a diverse portfolio of technologies:

- Government will contribute an additional £5m per annum to the low carbon transport theme of the Energy Technologies Institute – ensuring transport is at the heart of the Government's strategy to accelerate the development of secure, reliable and cost-effective low-carbon energy technologies; and

- Government will help finance and develop a new Low Carbon Vehicle Innovation Platform[46] providing critical coordination and [financial/up to £30million of] support from 2008/09 aimed at accelerating UK technology research that the market, if left alone, may not have carried out. Assuming the Innovation Platform develops successfully we would envisage extending the programme to run over a number of years.

Public procurement

375. Public procurement can be an effective tool for transforming markets and with initial funding of £20m, Government will develop a new programme of public sector procurement to promote and support low carbon vehicle development, including small fleet demonstrations to provide early markets for new innovative lower carbon vehicle technologies.

376. We will also review the standards and targets for the Government car fleet to ensure that Government leads the way in reducing CO2 emissions from new cars. An updated Government new car average CO2 emissions target will be published in due course that will ensure that the rate at which new car CO2 emissions improve in the Government fleet exceeds the rate at which emissions improve for the UK and EU new car fleet. These interventions can be effective as, by increasing the visibility and certainty of an

[45] www.dft.gov.uk/pgr/scienceresearch/technology/lctis

[46] Innovation Platforms are schemes designed to bring Government and funders together with the business and research community in order to address a major market driven and societal challenge. Existing Innovation Platforms include work on intelligent transport systems and services, in the context of road congestion. More information can be found at: www.dti.gov.uk/innovation/technologystrategy/innovation_platforms/index.html

early market for a new lower carbon model they have the potential to substantially reduce the risks faced by companies when considering whether to introduce a new technology to the marketplace.

Providing Information and advice

377. Although carbon pricing, fiscal incentives and improvements in technology can deliver significant energy savings we also need to remove barriers to behavioural change if we are to realise the full potential for energy savings through improved energy efficiency in the transport sector.

Promoting the use of public transport

378. An important element of the UK's strategy for improving the energy efficiency of the transport sector is to encourage people to make more sustainable choices, and in particular to walk, cycle or use public transport instead of the private car where this is feasible.

379. The Government considers public transport has an important role to play in saving energy and reducing carbon emissions. It is seeking to encourage greater use of public transport where this is the best mode for the journey, through sustained investment to improve services and by providing better information on journeys, for instance through Transport Direct. This is helping make public transport a realistic and attractive option for more journeys. This is why we are putting record amounts of investment into public transport to give people a real alternative to using their car. As a result, the UK now has the fastest growing railway in Europe and the highest number of rail passengers in 40 years.

380. This summer the Government intends to publish a long term rail strategy setting out the challenges facing the railway over the next 30 years and the respective roles of Government and industry in responding to these. The three main issues this document will consider will be: improving the capacity of the rail system to meet increasing passenger and freight demand; reducing its environmental impact; and meeting the needs of increasingly demanding customers.

381. It is clear to the Government that rail must improve its carbon efficiency in order to maintain its environmental advantage over other modes and to reduce its operating costs. The rail industry has also recognised the importance of improving its environmental performance to its longer term success.

382. Environmental objectives have been included in recent franchise specifications to ensure a greater focus on environmental issues within the day to day running of train operations and to encourage the development of a sustainability culture throughout the rail industry. The Government intends to include such objectives in all future franchise specifications. These will be reviewed and updated as each franchise specification is developed to ensure that they remain relevant, challenging and take account of industry best practice.

383. The Government together with the industry is undertaking a range of research projects to understand better how the rail system uses energy and to identify both operational and technical measures to reduce carbon emissions. As part of this initiative a programme to roll-out regenerative braking across much of the electric rolling stock fleet is taking place. We are also supporting trials of diesel battery hybrid trains that could offer significant energy savings compared to conventional designs.

384. The Department for Transport is currently leading the Inter City Express (IEP) programme which sets out to deliver a best overall value solution for train replacement and demand growth on key long distance routes. For both environmental and cost reasons, a key objective will be to ensure that the new high speed train is as fuel efficient as possible. It is envisaged that the new trains will start to enter full in-service deployment taking place from 2014 onwards. We fully expect energy efficiency to become a key objective within all future rolling stock procurement exercises.

385. In addition, the rail industry is running a series of test bed and service trials to assess the technical risks involved in using a range of biodiesel blends in existing diesel rolling stock and to evaluate more fully the environmental benefits. Results are expected in summer 2008.

386. Looking ahead, we anticipate the following:

- optimising the rail network for energy efficiency. Reducing the number of unnecessary stops between stations and providing better information to drivers on appropriate speeds could deliver substantial carbon benefits as well as improving performance and increasing the effective capacity of the network. Network Rail is working with its industry partners to develop a scheme for application of this technology, which will be even more effective when applied in combination with precise train positioning using satellites;
- using onboard electricity meters for all electric trains. Although having no direct benefit, the ability to measure directly the effect of auxiliary power saving, driver training, advisory speed and other traction energy schemes and to compare the energy performance of trains for maintenance purposes has been estimated by Scandinavian countries at around 7% of overall traction energy cost. The Government intends to encourage the system wide deployment of onboard metering. An initial trial is being developed with a number of train operators; and
- developing more sustainable stations and depots. New depots and stations offer an opportunity to draw on best practice in sustainable building design, for example by including rainwater harvesting, renewable electricity generation and high standards of energy efficiency. A moderately large station development could also use combined heat and power plants to provide electricity and heating for both the station and any neighbouring retail facility.

387. As part of the commitment to providing real alternatives to the car, local and central Government are now spending about £2.5 billion a year to provide bus services. Government is also extending the scope of Concessionary Bus Travel across England, guaranteeing everyone aged 60 and over and disabled people, free off-peak travel on all local buses anywhere in England from April 2008.

388. Re-energising bus use is particularly important for giving people choice, encouraging a shift from car-use and greater use of lower-carbon transport choices. In December 2006 the Government published proposals for a modernised national framework for bus services, in Putting Passengers First. These proposals, along with other measures to help tackle congestion and improve public transport, are included in the draft Local Transport Bill, published in May 2007.

389. In Scotland the Scottish Executive introduced a national free bus scheme on 1 April 2006, with no peak time restriction, for people aged 60 and over and disabled people. The scheme is run by Transport Scotland. The scheme also includes a minimum of two free return ferry trips to the mainland for older and disabled islanders.

390. In addition, the Scottish Executive is also introduced a scheme of national bus, rail and ferry concessionary travel for young people in January 2007 (initially for all in full-time education and training). The main elements of the scheme are:

- all young people aged 16-18 years (up to 19th birthday) are eligible, as well as full-time volunteers up to the age of 25;
- it will ultimately be Smartcard enabled with a stored travel right, but while the technology is still being rolled out, each eligible young person will receive a card for bus travel use and can also apply for a Scottish Youth Rail Card;
- the applicable discounts are 1/3 off single bus fares and rail fares (single, return and season); and
- eligible young people resident on Scottish islands will also receive 2 free return journeys to the mainland per annum.

391. The Scottish Executive published its 17-point Bus Action Plan in December 2006 to improve and develop bus services in Scotland, and help to encourage investment in cleaner and more innovative vehicles.

392. Putting Passengers First also highlighted the potential case for refocusing bus subsidy to provide a more direct linkage with the Government's priorities of tackling congestion and improving the environment and accessibility. The Government is considering these issues further with interested parties, including the scope for refocusing the current subsidy based on fuel consumption into one which is more directly linked to performance and environmental outcomes. The Bus Action Plan in Scotland will also examine performance-related funding for payment of Bus Service Operators Grant in Scotland.

393. In addition to the investment outlined above, the Government has also earmarked up to £200 million per year from the Transport Innovation Fund to support packages of measures in England that combine demand management, such as road pricing, with modal shift and better bus services. Already ten areas have been awarded more than £14 million of pump-priming funding to support the development of proposals, the first of which are expected in July 2007. It is expected that these proposals will make a contribution to reducing carbon and air quality emissions by improving services and reducing road congestion.

Smarter travel choices

394. In addition, the Government has put in place a substantial programme to promote changes towards more sustainable patterns of travel behaviour using a range of measures collectively known as Smarter Choices[47]. These include workplace, school and personalised travel planning, travel awareness campaigns and marketing and offer great potential to reduce congestion and carbon emissions.

395. Local authorities are the key delivery agents for using Smarter Choices, primarily through the land-use planning system and as part of their 5 year Local Transport Plans (LTPs). In February 2007 the Government also launched a new Business Travel Network to encourage more businesses to develop voluntary travel plans.

396. By 2008, the Government will have provided over £100 million through its Travelling to School Initiative, which aims to encourage every school in England to have an active travel plan in place by 2010. The funding includes £7.5m each year to fund a network of 250 local authority based travel advisers to work with schools and help them develop and implement school travel plans. Funding also includes grants to schools with an approved school travel plan, which will make up more than 50% of English schools by summer 2007, and over £70million is expected to be allocated to more than 10,000 schools (approx 40%) that have an approved travel plan.

397. In November 2006, the Government made up to £5 million per annum available to encourage more children to walk to school e.g. through the "walking bus" scheme launched last November. More than 1 in 6 primary schools in England applied, and it is expected that the car trips saved will produce extremely cost effective environmental, health, and congestion benefits. At the same time the Government published "Links to Schools", promoting the successes and achievements of such schemes to local authorities, helping to demonstrate the possibilities and potential of active travel.

398. The Government also has a continuing commitment to promoting active travel, encouraging people to view cycling and walking as viable alternatives to the car. In September 2006, following the doubling of Cycling England's budget, we launched the pilot phase of Bikeability, the new standard for cycle training, taking cycling proficiency into the 21st Century. This will be rolled out later in 2007.

399. We will continue to assess the potential of smarter choice measures with ongoing programmes such as the Sustainable Travel Towns initiative, to provide further evidence of the benefits and guidance to others on how to implement such measures. Although not complete, initial results are promising, showing that in the target population area public transport use has increased by over 10%, with car use among the targeted population decreasing by a commensurate amount.

400. In Scotland the Scottish Executive is providing funding to Local Government, Regional Transport Partnerships, and the Energy Savings Trust to increase the take-up of workplace and school travel plans across Scotland.

[47] www.dft.gov.uk/pgr/sustainable/smarterchoices/

401. The Executive is also currently providing annual funding of around £6 million for School Travel Co-ordinators. The funding is used for salaries, marketing, education, and infrastructure at and to schools. In addition by March 2008, nearly all Scottish schools will have 20mph zones. These have been funded separately. The Execcutive currently provides annual funding to local authorities of around £9 million for Cycling, Walking and Safer Streets projects Cycling Scotland receives core funding in Scotland for: provision of technical advice, cycle promotion and events, and cycle training to the UK national standard. The Executive also funds Sustrans to roll out the National Cycling Network across Scotland, and is now focussing on the links between the network and important destinations such as schools, public buildings and shopping centres.

Labelling

402. 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.

403. 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.

404. The European Commission has proposed an amended and broadened Car Fuel Efficiency Labelling Directive (1999/94/EC) to improve and harmonise the design of the label throughout the EU to incentivise consumers and producers toward more efficient vehicles. As with other products, "A" label status will be reserved for the 10-20% best performing cars and the labelling scheme will be updated after 3 years.

Communications Campaigns

405. The Government is keen to raise awareness amongst motorists of what they can do to help reduce emissions. The scope for reductions from individual motorists taking action is considerable. For example, if everyone purchasing a brand new car chose the most fuel efficient car within its class and price range, CO_2 emissions from new cars could be reduced by 24%[48] If all drivers in the UK adopted smarter driving techniques CO_2 emissions and energy consumption from the fleet could be reduced by around 8%[49].

406. To promote these benefits a consumer facing communications strategy covering smarter driving and new car purchasing was launched in March. The advertising includes TV and radio coverage, the national and motoring press, and on-line activity targeted at drivers and new car purchasers. This car purchasing element of the campaign builds on the introduction in 2005 of the colour-coded fuel economy label for new cars, linked directly to Vehicle Excise Duty (VED) CO_2 bands are now found in the majority of new car showrooms.

[48] This is based on 2005 registration data and WhatCar? classifications.

[49] This is based on trials undertaken by the Driving Standards Agency (DSA). The fuel cost saving is calculated using fuel prices taken on 5/1/2007. The CO2 emissions were calculated using 2005 car and taxi fuel sales figures from 'Transport Statistics Great Britain 2006'.

407. The Smarter Driving strand of the campaign focuses on existing car drivers and complements the work of the Driving Standards Agency (DSA) to include eco-safe driving in the L-test for all new drivers from 2008. Advice and training on eco-driving for van and HGV drivers is already provided through DfT SAFED (Safe and Efficient Driving) programme.

408. In Scotland an "eco-drivers wanted" campaign, funded by the Scottish Executive and managed by the Energy Saving Trust, was piloted in a key transport corridor in Scotland in January this year. The evaluation will be completed shortly – and an assessment will then be made on roll out.

409. We are also making information available to consumers about the carbon impacts of their journeys through our award-winning journey planner Transport Direct[50], which allows users to compare the relative carbon impacts of different travel modes for their journey.

Energy Saving Trust Programmes

410. The Energy Saving Trust plays a vital role in working towards a more energy efficient transport sector through promotion of cleaner, lower-carbon vehicles and fuels, advice on eco-friendly driving techniques and low-carbon transport alternatives. This advice is available to businesses through a green fleet review or telephone advice and also to the consumer through the Sustainable Energy Network of advice centres.

411. For an organisation which runs a fleet of 50 or more vehicles (cars and vans up to 3.5 tonnes including leased cars), or 20 or more in Scotland, EST offers a free green fleet review with free telephone advice available to operators of smaller fleets. The scheme offers a tailored, independent review of all aspects of the fleet from an environmental perspective and provides a comprehensive report on future actions.

412. The Energy Saving Trust's Transport Advice work aims to influence organisations in three key areas:

- the purchase of lower carbon vehicles;
- changing driver behaviour to improve fuel consumption; and
- encouraging reduced vehicle usage.

The objective is to create a culture change in organisations and embed best practice in fleet management as part of long term continuous improvement.

The Energy End Use Efficiency and Energy Services Directive

413. The Energy End-Use Efficiency and Energy Services Directive requires Member States to place obligations on suppliers of transport fuels to promote or offer either competitively priced energy services, energy audits or other energy efficiency improvement measures to their final customers excluding those covered by the EU-ETS. Article 13 of the Directive also requires supplier of transport fuels to provide information on energy efficiency with fuel bills. We will be consulting later this year on options for complying with this requirements.

[50] Further details can be found at www.direct.gov.uk/en/TravelAndTransport/index.htm

Summary of measures

To ensure energy efficiency is high on the international agenda we will work within the EU to:

- press for rapid and ambitious implementation of the Energy Efficiency Action Plan with the target of saving 20% of the EU's primary energy consumption by 2020;
- press for the EU, as a priority, to take action to raise energy performance standards of energy using products and vehicles;
- actively support the development of an international framework agreement for energy efficiency; and
- assist UK businesses and other organisations to access EU funding for energy efficiency.

Will work internationally to:

- take forward, with the G8 group of nations, the Gleneagles Plan of Action, and the priorities agreed in St. Petersburg in 2006 and Heiligendamm in 2007, including implementation of the 1 Watt initiative;
- raise appliance standards through co-operation in the International Task Force on Sustainable Products;
- help build regulatory and investment capacity for energy efficiency through our support of the Renewable Energy And Energy Efficiency Partnership;
- accelerate investment in clean energy technologies and energy efficiency through the Clean Energy investment Framework; and
- encourage co-operation and collaboration on the development of energy efficiency policies and technologies in appropriate international fora.

The case for international action

414. The Stern Review of the economics of climate change made clear that the scientific evidence for climate change is overwhelming, that it is a serious global threat and that as it is a global problem it demands an urgent global response. If the global economy is to make deep cuts in greenhouse gas emissions, we will have to live, work and travel differently. This will involve a sustained international effort to reduce emissions and promote low carbon technologies in every sector of the global economy – the investment decisions that will be taken over the next two decades will be critical in determining the world's climate and energy security. Actions we take in the UK, such as those set out in this Action Plan can achieve significant results but we need to work with other nations to establish an international framework to tackle climate change from 2012 when the first Kyoto commitment comes to an end. We consider that there are five essential elements to this framework.

- a shared vision of the long-term goal for stabilising greenhouse gas emissions to provide a yardstick for international efforts and give certainty to business about the future direction of travel;
- carbon pricing and emissions-trading; establishing a global carbon price would stimulate investment by the private sector in clean technology and energy efficiency. Emissions Trading, driven by deeper emissions targets in developed countries through innovative mechanisms such as the Clean Development Mechanism;
- international co-operation on technology and energy efficiency to stimulate and accelerate research and deployment of low carbon technologies and overcome barriers to cost-effective action to reduce energy demand;
- incentives for sustainable forestry management that reflect the value of avoiding deforestation; and
- support for developing countries to adapt to the unavoidable impacts of climate change.

415. Our international climate and energy strategy is therefore designed to accelerate the transition to a low carbon technology and ensuring security of energy supply. Alongside the promotion of open and competitive energy markets and driving investment to accelerate the deployment of low carbon technologies, the promotion of polices to promote energy efficiency, including particularly action to put a value on carbon emissions, is therefore a fundamental element of our international strategy. Globally, energy efficiency will be the most cost-effective means of tackling emissions whilst improving energy security. Indeed, the IEA has estimated that energy efficiency will account for 40-53% of all emissions reductions by 2050 in their long term projections of global emissions. And the potential for global energy savings is enormous – potentially 25-35% of primary energy consumption in industrialised countries and 30-45% for developing countries.

416. Both developed and developing countries will need to pursue energy efficiency opportunities to reduce greenhouse gas emissions, reduce their vulnerability to volatile energy markets, increase economic efficiency and competitiveness, and ensure access to energy to promote development and reduce poverty . The Stern Review made clear that even if the developed world takes on responsibility for absolute cuts in emissions of 60-80% by 2050, developing countries will need to take significant action too. In the case of developing countries, new capital stock is being added continuously, and big gains in energy efficiency can be achieved by leapfrogging in technology selection for the new stock. We will work with developing nations to find ways to secure reliable and affordable energy supplies and encourage them to acquire the most efficient and sustainable solutions

417. By acting internationally in co-operation with other governments and businesses we can help raise the profile of energy efficiency in the deliberations of the multi-lateral institutions, such as the EU, G8, UN bodies, WTO, International Energy Agency and the Development Banks, build global markets for energy efficiency, support international exchange of good practice in technology and policy, raise energy performance standards of internationally traded goods, build capacity for energy efficiency in the developing world, mobilise international finance to support investments in energy efficiency and

low carbon technologies and share experience about market and other mechanisms to encourage the efficient use of energy.

418. We must recognise that as economies have grown and become more globalised, many of the services, vehicles, appliances etc that we consume are internationally traded goods and that to improve their efficiency, we will need to show leadership through our domestic policies if we are to have credibility and influence in promoting action at an international level. In particular, if we are to realise the full potential of the policies outlined in this Action Plan and add value to the action we take in the UK we will need to work effectively within the EU to deliver a supportive and complementary energy policy framework in Europe that contributes to the delivery of our own objectives.

Working in the EU

EU energy policy

419. At the summit held at Hampton Court, London, in 2005 under the UK's EU presidency, EU leaders gave the European Commission a mandate to develop a common energy policy for the first time. This resulted in the Commission producing its Strategic Energy Review in 2007, which was endorsed by the UK and other Member States with the adoption at the European Spring Council in 2007 of a wide-ranging and ambitious climate change and energy policy package, including:

- an ambitious target to cut greenhouse gas emissions by 30% by 2030, provided other developed countries make similar commitments, and a binding unilateral EU commitment to cut greenhouse gases by at least 20% by 2020 compared with 1990 levels;
- an agreement to implement the EU's energy efficiency action plan as the means of reducing the EU's energy consumption by 20% by 2020;
- a binding target of a 20% share of renewable energies in overall EU consumption by 2020, and a 10% minimum binding target for the use of biofuels; and
- proposals for 12-15 carbon capture and storage (CCS) demonstration plants by 2015, with the aim for all new fossil fuel plants to be fitted with CCS by 2020.

420. With the adoption of this package, addressing climate change and putting the EU on track to a low carbon energy future is now at the heart of an EU energy policy that also stresses the necessity of increasing energy efficiency in the EU.

The Energy Efficiency Action Plan

421. A key element of the new EU Energy Policy was the endorsement of the target, set out in the Commission's Energy Efficiency Action Plan, to realise the potential to save 20% of the EU's primary energy consumption by 2020 through improved energy efficiency.

422. The EU has had a strong focus on energy efficiency in recent years and Member states are in the process of implementing a range of directives relating to buildings, energy services and co-generation which will all deliver significant energy savings across the EU. These Directives have had, and will continue to have a significant impact on the policy framework set out in this Action Plan, for example the provision of Energy Performance Certificates described in paragraph 152 fulfils a requirement in the Energy Performance of Buildings Directive. In the UK, we estimate that implementation of that Directive alone will deliver savings of 0.6 to 1.6 MtC per annum by 2010.

423. The Commission's Action Plan adopted in November 2006, and welcomed by the UK Government and other Member States recognised the need to do more within the EU to realise the significant energy-saving potential that remained across the Union in order to tackle climate change, reduce import dependency, promote security of supply and provide jobs and growth. This will build on the existing package of measures to provide a strong platform for the EU to demonstrate world leadership on energy efficiency and provide EU citizens with the globally the most energy-efficient infrastructure, buildings, appliances, processes, transport and energy systems . In order to deliver a 20% saving in energy saving by 2020, Europe will need to double the rate of improvement in energy efficiency compared to recent years. Success, however, would deliver savings of around 780 Mt of carbon dioxide and save business and consumers up to 100 billion euros a year.

424. The Action Plan contains a package of over seventy five measures which will come forward over the period to 2013 covering a wide range of cost-effective energy efficiency initiatives and identifies ten key priorities for action:

- making products more energy efficient;
- making buildings more energy efficient;
- making power generation and distribution more efficient;
- improving the fuel efficiency of vehicles;
- facilitating financing of energy efficiency investments for small and medium size enterprises;
- spurring energy efficiency in new member states;
- coherent use of taxation to promote energy efficiency;
- raising energy efficiency awareness;
- improving energy efficiency in built-up areas; and
- fostering energy efficiency worldwide.

425. The Government believes the package of measures in the Action Plan is ambitious but achievable and we will press the Commission to bring forward proposals in line with the ambitious timetable set out in the Action Plan and for rapid implementation of the commitments made.

426. We consider that as a priority the EU should bring forward proposals for action in those areas where the ability of individual Member States to take action nationally is constrained by the requirements of the single market, specifically:

- to improve minimum energy performance standards for appliances (including stand-by power) to support UK policies on energy efficiency set out in Chapter 3, by adopting new and ambitious standards for 14 priority product groups including boilers, water heaters, consumer electronics, copying machines, televisions, stand-by modes, chargers, lighting, electric motors and other products by the end of 2008 and update and expand product labelling regimes through revision of the Labelling Directive in order to provide a powerful tool for influencing consumer choice;
- to bring forward a legislative framework with more demanding mandatory fuel efficiency targets for vehicles to succeed the voluntary agreement with manufacturers; and
- to facilitate a more targeted and coherent use of indirect taxation to promote energy efficiency through a reduced rate of VAT for energy efficient products.

427. In addition, we consider that action in the EU can help us continue to realise the significant energy saving potential in the building sector, in particular through expansion of the scope of Energy Performance of Buildings Directive and development of a strategy supporting an EU-wide move to zero-carbon homes.

428. The Government also considers that the EU Action Plan should deliver a more central role for energy efficiency in the EU's external relations and dialogues with both energy producers and energy consumers to facilitate collaboration and joint action to promote energy efficiency. We therefore welcome the proposal from the Commission to develop an International Framework Agreement on Energy Efficiency with both developing and developed countries. We will work with our EU and international partners and deliver an effective and wide-ranging agreement with a focus on regulatory co-operation, energy efficiency measurement and evaluation, labelling, and performance standards for internationally traded goods, co-operation on technology development and deployment, and financing for energy efficiency.

429. As Chapter 3 made clear, we also see the EU-ETS as a key driver for energy efficiency in the business sector and, in future, in the transport sector and establishing a price for carbon as the most cost-effective means of encouraging a change in investment patterns towards a low carbon economy. An effective EU-ETS can only be delivered at the EU-level and the Government's priority is to achieve agreement to the adoption of a more ambitious scheme in the EU post 2012 to serve as the basis for an effective global market providing a secure international framework for action, expanding the coverage of ambitious, quantified emissions reduction targets and tackling concerns about international competitiveness. An increasing number of countries and regions are developing or propose to develop emission trading schemes (eg Norway, Switzerland, Japan and state-level schemes in the US and Australia) and properly constructed links to such schemes will increase the liquidity of the carbon market to the benefit of all participants.

430. The Government is also committed to assisting UK businesses and other organisations to access EU funds available to support research and development of energy efficiency technologies and innovative policy solutions. Advice and assistance is available through the Energie Helpline (www.energiehelpline.co.uk) which acts as the national contact point for the 'Energy' Theme of Framework Programme 7 (FP7) and for the Intelligent Energy Europe (IEE) programme.

Beyond the EU – Working internationally

431. The G8 group of nations, as developed countries responsible for around 60% of the world's total energy use, have a particular role to play in demonstrating leadership in managing energy demand and energy efficiency has been high on the G8's agenda in recent years.

432. As part of the Gleneagles Plan of Action, adopted under the UK Presidency of the G8 in 2005, the International Energy Agency is currently undertaking a major programme of work, including a review of existing building, appliance and vehicle standards, and the preparation of indicators to assess efficiency in industrial sectors and identify the most effective policies. The UK is actively engaged in this work which will report to the Japanese Presidency in 2008.

433. We are also actively working with our G8 partners to implement the priorities agreed at Gleneagles in 2005, St Petersburg in 2006, and Heiligendamn 2007, in particular to:

- implement the Gleneagles Plan of Action including the 1 Watt Initiative to reduce stand-by power consumption for new appliances to one watt or less by 2010;
- take forward the concrete recommendations from the IEA to the Heiligendamn Summit for further action on energy efficiency in buildings, efficiency standards for appliances, lighting and vehicles, energy labelling, energy efficiency indicators, public procurement, investment and development of national energy efficiency strategies;
- encourage the World Bank and other International Financial Institutions to further broaden and improve their financial framework for energy efficiency;
- work with the IEA and within the Gleneagles Dialogue on Climate Change, Clean Energy and Sustainable Development to explore the most effective means to promote energy efficiency internationally;
- promote international research, encourage investment and development co-operation aimed at promoting energy efficient technologies;
- increase dialogue with the major emerging economies towards a reduction of energy consumption in energy intensive industrial sectors;
- set up a Sustainable Buildings Network to develop practical instruments for assessing and advising on the implementation of energy efficiency in buildings;
- work to increase energy efficiency in the transport sector and introduce energy labels for vehicles;
- stimulate investments in high efficiency power plants; and

- adopt instruments and measures to significantly increase the share of combined heat and power in the generation of electricity.

434. The Gleneagles Dialogue, launched at the G8 Gleneagles Summit in July 2005, is a process that brings together 20 countries with the greatest energy needs, including the G8 and the major emerging economies of Brazil, China, India, Mexico and South Africa, and allows them to informally discuss innovative ideas and new measures to tackle climate change outside the formal negotiations under the United Nations Framework Convention on Climate Change (UNFCCC). The Gleneagles Dialogue also monitors the implementation of the Plan of Action, to ensure the commitments made by the G8 heads at Gleneagles are delivered and provides a forum to engage a wider community in responding to the recommendations for action on energy efficiency emerging from the work being undertaken by the IEA.

435. As a member of the IEA, the UK is also involved in the wider work of the Agency on energy efficiency policy analysis which informs UK policy development and the Government also facilitates engagement of UK business and other organisations in the IEAs Implementing Agreements which undertake collaborative research on a range of energy end-use technologies.

436. The UK is also an active member of the Energy Charter which aims to develop efficient, sustainable and secure energy markets. In particular, we work through the Charter's Protocol on Energy Efficiency and Related Environmental Aspects to exchange good practice with countries throughout Europe and the former Soviet Union to assist energy efficiency policy development.

437. The Stern Review found that international co-operation and co-ordination of regulations and product standards can be a powerful tool for encouraging greater energy efficiency, raising their cost effectiveness, strengthening incentives to innovate, improving transparency and promoting international trade and this is a key focus of our international efforts to promote energy efficiency**.**

438. The UK leads the International Task Force for Sustainable Products is a UK initiative, under the United Nations Marrakech Process, which aims at improving international co-operation to encourage more sustainable products through better product performance information and standards The aim of the task force is to examine how commitments made in for a such as the G8 and UN's 2nd Experts Meeting on Sustainable Consumption and Production can be turned into practical actions that will benefit both industrialised and developing nations. The taskforce will:

- raise consumer expectations that products should not only be fit for purpose and safe but should also be sustainable;
- refine and communicate a shared vision of sustainable product design and challenge industry to deliver it;
- determine where there are shared concerns about product groups, associated environmental impacts and wider sustainability issues;

- strengthen and improve the coherence of performance measurement, labelling and product information systems to promote the development and marketing of more sustainable products;
- establish and promote performance benchmarks, which could be applied widely in practical policy measures such as procurement, looking ahead to their future development;
- identify and promote existing, successful product policies that could be adopted more widely or extended and adapted to address wider sustainability issues;
- build capacity within the whole spectrum of industry to enable it to compete in local, regional and global markets to supply products that will meet projected sustainability requirements; and
- establish sustainable design strategies and co-operation instruments with special regard to the needs of SMEs and micro-enterprises.

439. We will also continue to work bi-laterally with our international partners to share experience and lessons learned from UK energy efficiency policy and explore opportunities for co-operation and collaboration.

Mobilising finance and capacity building for energy efficiency

440. Global demand for energy is increasing significantly, particularly in the developing world. The IEA estimate that by 2030 global energy demand will increase by 46% with over 70% of this increase coming from the developing world. Meeting this demand will require an estimated $20 trillion dollars of investment by 2030. The investments made now will lock in technologies and emissions profiles for the next 50 years and it is therefore essential that these investments are as climate friendly as possible. We are therefore working internationally to mobilise finance for significant investment in low carbon solutions and energy efficient technologies through the Clean Development mechanism and working closely with International Financial Institutions.

Clean Development Mechanism

441. Trading mechanisms such as EU ETS and the Clean Development Mechanism (CDM) allow cost effective sharing of the burden of reducing carbon emissions. In addition, CDM provides a valuable means of securing low cost emissions reductions, while promoting the deployment of low carbon technologies in developing countries.

442. The Government is seeking reforms to sale up and reform the CDM mechanism in order to provide greater certainty and continuity in the market, we will therefore:

- work through the EU to strengthen EU ETS to stimulate demand for CDM credits;
- press the UN to ensure that CDM credits from projects registered before 2012 will be valid for compliance in ETS phase III;
- support development and piloting of new trading instruments which facilitate enhanced participation of developing countries, including different ways of crediting emissions reductions within the CD such as programmatic and sectoral approaches; and

- seek to ensure that the UN project mechanisms including the CDM, deliver real emissions reductions, The UK supports the continued improvement in the procedures of setting baselines, and for the establishment of additionality, Increased transparency and public scrutiny can also play an important role in ensuring high standards are met.

Clean Energy Investment Framework

443. The Gleneagles Plan of Action adopted under the UK Presidency of the G8 tasked the World Bank and Regional Development Banks to develop a new framework for accelerating investment in cleaner energy and adaptation to climate change. The goal of the CEIF is to increasing the effectiveness of existing sources of energy investment in order to leverage additional investment and improve co-ordination and coherence between the spectrum of different funding sources.

444. The Government has committed over £15m to the CEIF so far, including £3m for technical support in developing the CEIF and supporting discussions in developing countries; £10m to fund posts and programme budgets across the multilateral development banks and UNDP over the next 3 years; and £3m to the European Bank of Reconstruction and Development's Sustainable Energy Initiative. The UK has also announced support for one of the first projects to be developed under the CEIF framework – an investment in wind power in Mexico.

445. By the summer 2008, we expect to have made substantial progress on a global investment framework beginning to deliver results, loaning in the region of several billion US dollars per year.

The Renewable Energy and Energy Efficiency Partnership

446. The Renewable Energy and Energy Efficiency Partnership (REEEP) is a successful multi-stakeholder partnership that aims to foster better market conditions for sustainable energy investments through innovation and the reform of policy and financing frameworks. Launched by the UK Government in 2002 at the World Summit for Sustainable Development, it now has over 160 partners including 30 governments from around the world.

447. REEEP works with governments to translate commitments for sustainable energy into concrete actions on the ground. REEEP is focused on specific actions in two key areas:

- policy and regulation: assisting governments with regulatory and policy frameworks which integrate renewables into the energy mix, promote energy efficiency and to help establish "investor friendly" climates; and
- innovative financing: assisting with the creation of renewable energy funds, financing models, Energy Supply Company (ESCO) business models, tradable renewable energy certificates schemes and bundling of small scale projects.

448. the UK has to date provided the bulk of REEEP's funding, in addition the partnership receives funding from a number of governments including: Norway, Australia, Germany, Austria, Canada, Ireland, Italy, Spain, The Netherlands, The United States and the European Commission.

449. REEEP's regional secretariats provide access to best practice in policy and finance to promote renewable energy and energy efficiency and have an important role in the selection and administration of REEEP funded projects in their regions. Regional secretariats are hosted by pre-existing organisations in 8 regions (North America; Latin America & Caribbean; Mediterranean; Central and Eastern Europe; Russia & Former Soviet Union; China; India; South East Asia & Australia). REEEP's International Secretariat engages political, financial and business support for the partnership, co-ordinates the provision of central services such as communication and selects and administers central projects.

450. Successful projects delivering energy efficiency have included the development of incorporation of financial models into USAID Watergy projects and allowing seven South African municipalities to fund energy efficiency projects in water supply (pumping); financing energy efficient street lighting in Madhya Pradesh, India; establishment of a $50m sustainable energy investment fund providing services and investment capital to enterprises in South East Asia, China and India; development in conjunction with the University of Colorado of an international database of renewable energy and energy efficiency law to assist countries in developing sustainable energy legislation and regulation; removal of financial barriers to the implementation of energy efficiency investments in the industrial and commercial sectors in Central America and Mexico; capacity building in former USSR states to enable Governments to formulate policy promoting the development and implementation of residential energy efficiency projects.

451. Projects being undertaken in the current delivery period (2006-07) include: promotion of energy efficiency through city energy strategies in South Africa; facilitating financing for energy efficiency CDM projects in Southern Africa using the Gold Standard as leverage; formulation of national policy on energy efficiency for Liberia; development of an energy audit toolkit for use on Indian commercial buildings; harmonisation of government procurement policy for energy efficient products in APEC countries; increasing energy efficiency in the building sector of Japan; providing training to energy projects developers in Brazil, China and the Philippines on the Gold Standard for CDM; development of a structured energy efficiency programme for the implementation and financing of energy efficiency projects in the commercial and industrial sectors of Brazil; running of a regional standards and labelling programme in Central America; training and capacity building to improve compliance with new building energy codes in the Russian federation and Republic of Kazakhstan; supporting the capacity of local governments in countries of the Commonwealth of Independent States to obtain financing for municipal energy efficiency projects.

Access to Energy

452. In developing countries, the lack of reliable and affordable energy supplies and services is both a cause and a symptom of poverty The IEA estimates. that about 1.6 billion people – a quarter of the world's population – have no electricity in their homes. A far greater number of people – about 2.4 billion – collect basic biomass fuel (such as charcoal, wood, straw and animal waste) for their daily heating and cooking. Energy efficiency can play an important role in increasing access to energy by reducing waste and we are working with the international development community such as the United Nations, the World Bank and other international finance institutions and with the European Community to improve access to clean energy, especially for poor households and communities.

This annex outlines the UK's approach to evaluating energy and carbon savings from Energy Efficiency Improvement (EEI) measures and how this may be applied to demonstrate savings under the Energy Services Directive.

It comprises two sections:

- A1: Introduction to the UK's approach to policy evaluation and the estimation of energy and carbon savings
- A2: Methods used to estimate savings from ongoing and future policies

A1: Introduction to the UK's approach to policy evaluation and the estimation of energy and carbon savings

A paper by the UK Government's Interdepartmental Analysts Group (IAG) "Greenhouse Gas Policy Evaluation and Appraisal in Government Departments" details the UK's approach to energy policy evaluation. See www.defra.gov.uk/environment/climatechange/uk/ukccp/pdf/greengas-policyevaluation.pdf.

This paper was prepared to assist Government departments, agencies and others undertaking policy evaluations, and to provide a common basis for comparison of the cost effectiveness of different policies and measures. It complements the Treasury Green Book (see http://greenbook.treasury.gov.uk/), which provides the main source of information about evaluations and appraisal in UK Government.

The IAG guidance covers the assessment of costs and benefits from existing and proposed policies, including cost-effectiveness per tonne of carbon, sectoral impacts, impacts on public spending, and where relevant, impacts on energy security, air quality, competitiveness and fuel poverty.

It provides the following guidance relating to estimations of carbon and energy savings:

- Energy/carbon savings should be estimated over the lifetime of the measures rather than the policies. For example energy savings from cavity wall insulation will persist long after the Energy Efficiency Commitment policy that led to its installation.
- All savings should be considered relative to a "business-as-usual" baseline, which should be consistent with the latest projections by the Department of Trade and Industry (DTI).
- Carbon savings should be represented in million tonnes of carbon (MtC) and should be calculated from energy savings using the factors given on Defra's web site at http://defraweb/environment/envrp/gas/index.
- Benefits, including energy and carbon savings, should be counted as activities that are additional to business to usual/what would have happened anyway.
- Assessment of energy and carbon savings should take account of comfort taking. The estimated level of comfort taking will depend on the measure, with higher values assumed for fuel poverty programmes.

- Overlaps between policies should be described in the appraisal and taken into account to the extent possible.
- Account should be taken of deadweight, i.e. the extent to which a measure would have been implemented without Government action.

A2: Methods used to estimate savings from ongoing and future policies

The methods outlined in the IAG guidance were used to estimate savings from measures in the Climate Change Programme and, more recently, new measures announced in the 2007 Energy White Paper described in this Action Plan. Full details of the methods used and results obtained are available from:

Climate Change Programme Review – "Synthesis of Climate Change Policy Appraisals", January 2007, available from Defra web site at http://www.defra.gov.uk/environment/climatechange/uk/ukccp/pdf/synthesisccpolicy-appraisals.pdf

Energy White Paper – "Energy White Paper – Meeting the Energy Challenge, Chapter 10 Impact of our Measures", May 2007, available from DTI web site at http://www.dti.gov.uk/energy/whitepaper/page39534.html .

Defra report "Evaluation of the Energy Efficiency Commitment 2002-05" prepared by Eoin Lees Energy gives a practical example of how an existing UK energy efficiency policy has been evaluated following these guidelines. See http://www.defra.gov.uk/environment/climatechange/uk/household/eec/pdf/eec-evaluation.pdf.

We believe the UK's approach to the estimation of energy savings is broadly consistent with the guidance being developed by the European Commission's Evaluation and Monitoring for the EU Directive on Energy End-Use Efficiency and Energy Services (EMEEES) project for bottom-up evaluation although there may be some minor differences, for example in the lifetimes assumed for specific energy efficiency improvement measures.

Many of the policies that will contribute to energy savings under the ESD are not yet in place, or are relatively new and have not yet been evaluated. It is intended that the impact of these policies will be evaluated using the principles outlined above, but it is difficult to give any details of the evaluation methodology at this stage.

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