RESPONSE TO DTI CONSULTATION

THE ENERGY REVIEW

SUMMARY

- **The objectives of the 2003 energy white paper remain valid and important**. The objectives of achieving greenhouse gas reductions, a secure and stable supply, a competitive energy market and addressing fuel poverty remain critical. The market-based approach to securing these objectives cost-effectively by finding efficient prices, including the reflection of environmental externalities, is an important underlying philosophy.

- **The current emissions targets should be retained.** The government's commitment to reduce carbon dioxide emissions by 20% from 1990 levels by 2010 and by 60% by 2050 remain important objectives, despite the difficulties in meeting the first of these that have become apparent since this target was reaffirmed in May 2005. It is important that we meet or come as close as possible to the 2010 target, and that a meaningful target of the order of 30% below 1990 levels, free of ambiguity and hedging, is specified for 2020.

- **The science understanding suggests greater urgency.** The current targets were based on assumptions of stabilisation at 550 ppm CO2. These assumptions now look optimistic – the science is becoming ever more robust, and the prognosis has been steadily worsening as more has become known about feedbacks and climate sensitivity. The latest science suggests that stabilisation at 450 ppm may be necessary to have even a medium chance of avoiding dangerous climate change.

- **The current programme is not delivering on the ambition.** The Energy Review consultation confirmed that the existing programme was likely to achieve just a 10% reduction in CO2 in 2010 compared to 1990. New measures in the Climate Change Programme Review will reduce emissions to 15-18%, though the forecasting record so far has nor been reliable. Though the UK is likely to meet its Kyoto target comfortably, there is little reason for comfort in this as most of the reductions arose from the 'dash for gas' in the early 1990s.

- **There are clear weaknesses in the current framework**. The Environment Agency believes there are significant weaknesses in the current package of policy measures. In particular:
    - The lack of mechanisms to incentivise investment in carbon reduction post 2012.
    - The unambitious and piecemeal approach to energy efficiency despite considerable evidence that this is economically beneficial, regardless of the environmental and energy security benefits.
    - The speed at which Government reacts when policy does not deliver the level of benefits expected.
    - The weakness of policies to address energy-related emissions in the heat and the transport sector.

- **A new approach would emphasise energy efficiency and establish a market to reward low carbon technologies in energy supply**. The science and economics of climate change suggest that a conventional energy policy approach will be insufficient. Two strategic developments are required:

  i. social strategy – aiming to reduce the energy, carbon, commodities, water and other resources to produce each unit of output. For energy policy, this means a much broader and systemic approach to energy efficiency. In such an approach, energy saving would need to become integral to the energy supply business and no longer a regulatory burden imposed on it.

  ii. One or more mechanisms that reward investment in low carbon energy technologies over the long term (30 years) – either in energy supply or by saving energy. It will be important to establish a market price signal for carbon across all areas of the energy economy. Such mechanisms should provide a reliable financial incentive to be accepted as 'bankable' by project financiers and be technology-neutral, aiming to secure the most cost-effective technological responses from the diverse options available.

Energy efficiency

- **Energy efficiency measures are proving highly cost-effective and beneficial**. Research for DEFRA showed that the life-time economic value of the measures for the climate change programme so far to be NPV £80 billion *positive* (i.e. of economic benefit irrespective of environmental benefits), of which most relates to energy efficiency measures[1]. This confirms that there is a large stock of 'no-regrets' or 'win-win' measures. In sustainable development grounds, the Environment Agency regards exploitation of this 'reserve' of avoidable energy wastage as the highest priority.

- **The energy efficiency resource is substantial**. The size of this energy efficiency 'reserve' for the domestic, business and public sector is at least equivalent to 20MtC by 2020 (or about 17% of UK 1990 emissions for these sectors)[2]. Though this is a large potential, it excludes transport sector and only includes measures that are cost-effective at the energy prices of the time. Energy prices have recently increased sharply, and once a value for the carbon abatement is included (about €25/TCO2 in the EU Emissions Trading System), a much larger 'reserve' would be available cost-effectively. Further potential would arise from technology development, cost reduction and forcing as the market expands. This process mirrors the development of conventional energy reserves, in which price signals cause more exploration and improved technology making marginal fields cost-effective.

- **Energy efficiency policy is about realising economic gains not subsidies**. The policies needed for energy efficiency are primarily approaches removing the well-documented barriers to realising economically beneficial investments (e.g. split-incentives, information costs, high personal cost of capital for consumers),

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[1] Synthesis of Climate Change Policy Evaluations (April 2006), http://www.defra.gov.uk/environment/climatechange/uk/ukccp/pdf/synthesisccpolicy-evaluations.pdf

[2] HM Treasury, DEFRA, Energy Saving Trust, Carbon Trust. *Energy Efficiency Innovation Review*. December 2005.

not about subsidising technologies that are not cost-effective. In essence, the activity of making energy saving investments needs to become much more aggressively commercialised and driven by market mechanisms that share the economic benefits of energy and carbon savings between users and a commercial entity. This means reshaping the market to make 'energy services' the product on sale.

- **Behaviour change**. Any strategy for energy efficiency will in part rely on consumers' behaviour and willingness to allow the necessary investments. It will be important to reduce transaction and information costs, give incentives and make it easy to participate constructively. We recommend that the Energy Review team frame the policy package using the four point approach of the UK Sustainable Development Strategy intended collectively to catalyse changed behaviour:

    - **Engage** – communicate attractive value propositions and insights. There is a high level of concern about climate change, so a powerful narrative about energy efficiency is plausible. People may be more engaged if they have their own embedded energy supply and smart metering.
    - **Enable** – make it easy to participate by having high product standards and making energy-saving a business opportunity for energy suppliers. We recommend an evolution of the Energy Efficiency Commitment in this direction and support high standards for appliances, in building regulations and a tough Code for Sustainable Homes.
    - **Encourage** – establish an incentive structure using taxation, extensions to trading systems to cover commercial and public sectors and market signals or other economic instruments.
    - **Exemplify** – do more on the government estate and establish good demonstration sites.

    We have set out a detailed approach to energy efficiency using this framework in our submission.

Long term carbon mechanisms

- **A long term price signal for carbon.** A key challenge to energy policy focussed on securing climate change objectives is how to encourage long term investments in low-carbon technology, when there is a pronounced mismatch between the policy horizon and investment appraisal horizon. Investors currently need to estimate the future value of carbon, but this value is heavily determined by a future policy framework that is not yet in place. Therefore the main uncertainty is 'policy risk', which is utterly determined by government commitment and policies.
- **A new market mechanism**. We recommend development of one or more mechanisms that give a robust value to carbon over the next few decades. There are several options for doing this – including auctioning for futures contracts to reduce carbon or extensions of emissions trading within the UK. At this stage, it is the design criteria that are important. The mechanism should have the following characteristics:

- **Long-term.** 20-30 years would be needed to bring in major low-carbon developments;
- **Investment-credible.** It would need to reward low carbon investments with an acceptably certain return for their low-carbon characteristics. A contract with legal standing would offer the highest standard of credibility, a 'statement of intent' or just a target would be unlikely to be sufficient
- **Technology-neutral.** For the best allocative efficiency, such a mechanism should be extended to the widest possible range of technological approaches like nuclear power stations, carbon capture and storage or marine renewables, and include heat and transport options. More far reaching options would allow non-carbon greenhouse gas abatement or international bids through the Clean Development Mechanism, though we recommend separate evaluation of those options following experience with a more simple system.
- **Include demand-side investments**. An ideal system would allow demand-side measure (for example a local authority that wants to reduce energy use) to compete with supply-side options
- **The government bears policy risk**. The government underwrites or contracts a future value for carbon in advance of the design of the final policies that will deliver the value. Future policies might be later stages of the EU emissions trading system or a future evolution of the Climate Change Levy – but until the mechanisms are actually in place, the price signal to long-term investors will have to come from government.

Other issues

- **Transport**. More government attention should be given to efforts to reduce emissions from the transport sector, including:
    - The development of a coherent environmental transport strategy that is consistent with its stated aims to reduce greenhouse gas emissions. If this is not achieved there is a serious danger that emission cuts in other sectors will be undermined by the forecasted growth in transport emissions.
    - Any credible strategy must make use of all elements of the Government's Sustainable Development diamond, including fiscal incentives to influence behaviour and manage demand.
    - Action must be taken to reduce the growth in emissions from aviation. Every effort should be made to include aviation in to the EU ETS, but if this is not achievable in the short term then the Government should consider implementation of an Air Passenger Duty or an EU-wide emissions charge.
- **The review will be a major test of the Government's Sustainable Development strategy, launched by the Prime Minister in February last year**. All environmental impacts should be considered and a system-wide approach taken to minimising unsustainable and intergenerational environmental impacts. All technologies will have some environmental impacts. We need to be clear about the relative impacts between the options and seek to minimise these

impacts as far as possible.

- **Technologies should be required to pass an environmental and safety threshold** before they can then compete for carbon credits against each other. In this way the advantages of each technology can be tested against each other.

- **Renewables are an important forward-looking technology**. The Environment Agency recognises renewables as a key component of the carbon-constrained 21st Century energy economy. However, it is important to ensure that these technologies are supported efficiently and that associated environmental impacts are a factor in determining the appropriate level of support. It is important to be clear about the rationale for supporting renewables:
    - **Innovation or industrial policy**. Technologies that are developing and are 'near-market' and are subsidised because there is a case to drive the costs down to a market level.
    - **Carbon policy**. For mature technologies, the value of renewables lies in reducing carbon and energy security. As technologies like onshore windpower and landfill gas become mature, we should expect them to graduate from mechanisms designs to support innovation to more general mechanisms rewarding low carbon performance.

- **Carbon capture and storage.** We recognise that carbon capture and storage has the potential to significantly cut emissions during the production and use of fossil fuels. It may be particularly important in countries likely to have high coal burn. However, before it is used on a commercial scale carbon capture and storage must achieve high standards of safety and environmental performance and a sound regulatory framework must be put in place. Effort and investment in energy efficiency and renewables should not be diverted for this purpose.

- **New nuclear power.** The Environment Agency does not take a position for or against nuclear power. Nuclear installations need to achieve high standards of safety, security, environmental performance and waste management. If it can meet these criteria, the advantages of nuclear power in terms of carbon reductions and energy security need to be market-tested against other ways of achieving emissions reductions and energy security cost-effectively. We are concerned about the displacement effect that a large programme of investment in one capital-intensive technology like nuclear may have on energy efficiency, CHP and renewable technologies.

- **Nuclear power in proportion**. Nuclear power accounts for 8% of the UK's primary energy (20% of electricity generated). The success of the Energy Review will depend on developing a strategy for the other 92%, not least transport. It is important that we seek cost-effective greenhouse gas reductions across all sectors. There is a danger that an excessive focus on nuclear power and electricity supply will mean an insufficiently robust approach to all primary energy, including heat and transport.

- **In considering a programme of nuclear new-build we make the following comments**:

- Before any new nuclear build can take place, the Government and the nuclear industry must design a waste management strategy that meets the tests of sustainability and public acceptability.
- Operators must use 'best practicable means' to ensure that radioactive waste is minimised and public radiation doses are as low as reasonably achievable.
- It cannot be assumed that the approach found for the existing stockpile of radioactive waste would be acceptable for waste arising from a new programme. It is a legal requirement that new practices involving radioactive substances are 'justified' i.e. that the benefits outweigh the associated detriments.
- The management of flood risks is an important factor that we would advise on for any applications for new nuclear stations. Flood risk assessments would be on a site by site basis and would take into account the growing scientific knowledge of risks of climate change on coastal sites, where most existing nuclear power stations are located.

- **Energy Security.** There are several options available to improve energy security:
    - Liberal energy markets are a key part of ensuring energy security, but this has geopolitical challenges. Securing internal and external free markets in energy should be a core goal of the EU energy policy.
    - Energy security detriments arise mostly from price volatility faced by end-users. It should be possible to arrange incentives that cause wholesale energy suppliers to reduce the volatility they pass through to consumers
    - Under an IEA agreement, oil-importing states hold reserves of at least 90 days of imports. A similar approach could be adopted for gas – a reserve could be managed by the grid operator, with a duty to secure stability and resilience.
    - Energy efficiency investment offers very high levels of energy security

- **Further consultation.** The current consultation poses only very broad questions on energy policy and does not set out specific policy proposals at this stage. We advise that once the Energy Review team reports in the summer Government should carry out further consultation on more detailed proposals for the way forward.

1.0 INTRODUCTION

The 2003 Energy White Paper set out a clear direction for energy policy with a number of short-term measures and policy aspirations. It committed the UK to reducing carbon emissions by 60% by 2050 and to making significant progress toward that goal by 2020. In the intervening period a number of further policies have been put in place to meet these targets, however, the results to date have been mixed and the UK's carbon emissions are now increasing.

Since the publication of the 2003 Energy White Paper the science on climate change has become more certain and the case for taking early action to reduce emissions and avoid dangerous climate change even more compelling. We support the goals set out in 2003 Energy White Paper. We welcome the Energy Review as a chance to assess progress and to put in place a long-term framework to ensure we are on track to meeting these goals. The focus of our submission will be on what more needs to be done to achieve long term carbon reductions of the scale needed to avoid dangerous climate change. The Environment Agency's role in energy is set out in Annex 1.

1.1 Progress since 2003

There has been some promising progress since 2003:

- The evaluation carried out for the Climate Change Programme has shown that the programme is on track to deliver 17MtC and that energy efficiency measures (which represent over 75% of the savings within the Climate Change Programme) are delivering at net benefit to the economy.
- Onshore wind is on track. British Wind Energy Association's latest projections show that they expect the sector to be able to deliver 6GW of capacity, almost 5% of UK supply, by 2010[3].
- The first year of operation of the EU ETS has illustrated some of the long term promise of the scheme. 263 million allowances were traded in total in 2005.

However, other areas where we expected more rapid progress have stalled:

- Energy efficiency programmes whilst delivering successfully have been unambitious in scale and therefore set against economic growth have not delivered a reduction in energy demand overall. For example, in the household sector demand for energy services such as comfort and home entertainment have increased at over 2% per annum outstripping energy efficiency improvements.

[3] BWEA (2006) Onshore Wind: powering ahead, http://www.bwea.com/media/news/060327.html

- Since 2004 carbon dioxide emissions have been rising
- A less diverse portfolio of renewable energy technologies has developed than hoped with offshore wind and marine technologies moving ahead only slowly.

1.2 The current package of measures for energy policy

Three years is not sufficient time to test recently implemented policies, however, taken as a package there are some observations that can be made on the balance of measures that are currently in place:

- Although many of the policy aspirations and goals set out in the 2003 Energy White Paper required action over decades many of the policy measures implemented as a result have been short term. A key weakness of current energy and climate change policy is the lack of mechanisms to incentivise investment in carbon reduction post 2012.
- We could be much more ambitious on energy efficiency. Evaluation to date has shown that these programmes have delivered the vast majority of savings to date at a net benefit to the economy compared to more expensive supply side measures. In contrast the money that is spent on them is often far short of that spent subsidising supply side measures.
- There is still no long term framework in place to resolve areas where the goals of energy policy conflict, for example the balance between energy prices, pricing carbon and fuel poverty. Conversely, not enough is made of areas that can meet all or multiple goals of energy policy such as energy efficiency.
- Government has been slow to react when policy has not delivered the level of benefits expected. Partly this is due to the wide spread of government departments with responsibilities to address carbon emissions.
- The benefits of policies and measures implemented 2003-2006 will increase and deliver ongoing benefits. Measures need time to establish – over the last three years measures in place before the Energy White Paper or those built on previous mechanisms have delivered the greatest benefits.
- There is still too much focus on the electricity supply sector and not enough on the heat and the transport sector.
- The Renewables Obligation has been successful at bringing forward onshore wind but has not delivered a diversity of renewable energy technologies and there are concerns about its value for money.
- There is no clear, coherent innovation policy for sustainable energy.
- The public sector could do more to demonstrate market leadership by significantly developing public procurement.

2.0 QUESTION 1: WHAT MORE COULD THE GOVERNMENT DO TO ENSURE THAT THE UK'S GOAL OF REDUCING CARBON EMISSIONS IS MET?

2.1 New science on climate change

Climate change is the biggest threat to our environment. Scientists agree it is happening and that human activity is increasing it. The flash flooding in Boscastle, the catastrophic sewage overflow into the Thames in 2004 and the predicted drought this summer all serve to highlight the type of problems we have to face as climate change bites. The science tells us that weather events like these will become more frequent and the extremes will get worse[4].

In order to avoid 'dangerous climate change' global temperature change needs to be limited to no more than 2 °C above pre-industrial levels. New scientific results show that, contrary to earlier evidence, stabilising atmospheric concentrations of greenhouse gases at 550 ppm CO_2 equivalent will give a very high risk of overshooting the 2 °C target. Even stabilising greenhouse gas concentrations in the atmosphere at a much lower level of 450 ppm CO_2 equivalent would only imply a medium likelihood (~50 %) of staying below 2 °C warming.[5]

Different models suggest that delaying action would require much greater efforts to reduce emissions later in order to achieve the same temperature target and that even a delay of 5 years could be significant. It will also bring additional costs. In 2005, the Association of British Insurers (ABI) launched a new study on the financial risks of climate change[6]. This study found that annual losses from the three major storm types affecting insurance markets (US hurricanes, Japanese typhoons and European windstorms) could increase by two-thirds to $27bn by the 2080s. In the UK, climate change could increase the annual costs of flooding almost 15-fold by the 2080s under high emissions scenarios. An important conclusion from the ABI's report was that many of the potential costs of climate change could be avoided by taking early action to reduce emissions.

It should be a top priority for the Energy Review to introduce a stronger package of long term measures to put us back on track to meeting these goals. We believe that the following measures would put us back on track to achieving long term carbon reduction targets of the scale that we need.

2.2 The 2010 target

It is vitally important that we meet or come as close as possible to our 2010 target of a 20% reduction in CO2 emissions to maintain credibility in our climate change commitment with business and our leadership internationally. The revised Climate Change Programme introduces measures to take us part way to meeting our 2010 target but more needs to be done between now and then to hit this target – decisions in the 2007 Spending Review and Budget, this Energy

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[4] We set out the likely impacts of climate change in more detail in our report – *The climate is changing time to get ready,* Environment Agency, 2005

[5] International Symposium on Stabilisation of Greenhouse Gas Concentrations- Avoiding Dangerous Climate Change. Presentations are available at www.stabilisation2005.com. The conference book was published in January 2006 by Cambridge University Press.

[6] ABI (2005) Financial Risks of Climate Change, summary available, www.abi.org.uk/climatechange

Review and sustainable communities programme will be crucial. Many of the recommendations we set out in this submission if implemented quickly could start to impact before 2010 and therefore help the UK meet this target. If the government has concluded the 20% target cannot be reached, then consideration should be given to setting a new challenging target to ensure continuing focus on the programme.

2.3 A 2020 target

The 2003 Energy White Paper established a new goal for energy policy of putting the UK on a path to cut CO2 emissions by 60 per cent by 2050, with real progress by 2020. The paper suggested that 'significant progress' by 2020 equated to cuts in the order of 15-25 MtC below business as usual levels of 135 MtC. However, a formal target for 2020 CO2 reduction has never been set.

The latest projections for the UK show that on the basis of current policies, CO2 emissions will be around 145 – 148MtC by 2020, only 10% below 1990 levels[7]. If the UK is still to achieve the level of emissions considered to represent significant progress, then further reductions of at least 25 – 35MtC will be required. The new measures announced in Defra's revised Climate Change Programme will contribute 7 – 12 MtC towards this goal (depending on the EU ETS phase II cap decision).

At the same time developments in climate change science indicate that in order to have a high chance of avoiding dangerous climate change, larger, long term emission reductions may be necessary. To have a reasonable chance of limiting greenhouse gas concentrations to 450 ppm CO_2 industrialised countries will be required to reduce their emissions in 2020 by at least 25 % to 35% below 1990 levels (in the UK's case a further 25 – 40MtC), with continued reductions to 80-90% in 2050[8].

We therefore broadly support the scale of cuts recommended in the 2003 Energy White Paper, but believe further cuts will be necessary. We also believe it is vital for the Government to set a formal target for 2020. **A 2020 target should be in the region of a 30% reduction in emissions from 1990 levels.** It is also important that a plan is developed to ensure that this target is reached across all sectors, so that the gains made in some areas of the economy are not undone by growth in others.

2.4 Programme management

The danger in setting a target for 15 years out in the future is that with no mechanisms to back it up it will be meaningless. Therefore, as well as signalling what progress by 2020 would represent success the Energy Review also needs to propose a way of tracking progress towards this target as well as policies to deliver it. This tracking could be in the form of interim targets or an envelope of improvement along an agreed trajectory towards the target.

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[7] Our Energy Challenge – Securing clean, affordable energy for the long term, DTI, January 2006.

[8] Den Elzen and Meinhausen (2006) Multi-gas emission pathways for meeting the EU 2°C climate target. In *Avoiding Dangerous Climate Change*, Schellnhuber (ed), Cambridge University Press, Cambridge, UK, pp 299-309.

A method of programme management and review needs to be in place to ensure we are on track to deliver and to alter and strengthen policies if we are not.

We welcome the commitment in the Climate Change Programme Review to report to Parliament on emissions, future plans and progress on domestic climate change. In additional to this we think that action on climate change and energy should continue to be supported by a strong cross-departmental group. This group should be responsible for preparing an annual report to the Energy and Environment committee on progress which also recommends measures to address any failure to meet these goals at the same time.

The involvement of the devolved governments in drawing up management programmes is essential so that their devolved plans aim to achieve the similar targets or make proportional contribution to the overall UK targets.

2.5 New market-based measures to create long term incentives for carbon reduction

Central to the success of the review in putting us back on track to meet our 2020 and 2050 carbon targets will be the introduction of market based measures to create incentives to invest in reducing carbon emissions over two or three decades. Sir Nick Stern has characterised the climate change issue as one of externalities and concluded that "the private sector will respond if governments set clear, long-term and credible incentives.[9]"

The price of carbon currently is almost exclusively determined by Government policies. Therefore there is a strong case that the Government should agree to bear some of the future policy risk, to induce the private sector to invest now, while uncertainties on future climate change policies are being addressed.

We believe any new measures should be open to all technologies, provide a price signal for carbon that will be sufficiently robust for investors to include in project finance appraisal and support both supply and demand side measures. There is a great potential for a step change in energy efficiency in the economy, and it essential that large scale energy efficiency investment programmes are able to compete on their merits and cost- effectiveness with other technologies to control emissions.

There are many imaginative ideas in the literature about what type of mechanism might perform this role[10]. They all conclude that Government should introduce a way of reducing the risk of the future price of carbon. Given the importance of international collective action on climate it will be crucial that any new mechanisms introduced in the UK are compatible with future international mechanisms including future phases of the EU ETS.

There are ways that the future policy risk of carbon prices could be reduced through early announcements about the way that future rounds of EU ETS will

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[9] "What is the Economics of Climate Change? Discussion paper. The Stern Review on the Economics of Climate Change, 31 January 2006", http://www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/sternreview_index.cfm

[10] See for example D Helm (2005) A new British Energy Policy, Social Market Foundation, or P Ekins (2005) An alternative to Carbon Contracts, Policy Studies Institute.

operate. The UK should continue to push for longer-term certainty within the EU ETS including early announcements on future caps, allocation methodologies and coverage of the scheme. The potential for this to reduce uncertainty for industry and encourage investment in low carbon technologies should be investigated further. However, given the uncertainties about future post Kyoto international agreements and mechanisms it is difficult to see how enough certainty could be provided through the EU ETS alone at this stage over the timescales needed.

One mechanism that would allow Government to underwrite future risk in carbon prices and provide this investment signal is the auctioning of long term carbon reduction contracts[11]. These would effectively guarantee investors a minimum price for carbon reduction. All sectors would be encouraged to bid into this confidential auction setting out what carbon emission reductions they could achieve, by when and at what price.

Government then having contracted with a range of parties to achieve future carbon savings would recoup their costs through future policy initiatives that will put a price on carbon such as future rounds of the EU ETS and future domestic and commercial trading schemes.

Key to the success of such a scheme would be the need to agree a robust baseline for each of the sectors and a method of auditing savings and to build in penalties or break points for specific projects for non-delivery after a period of time. We believe that valuable lessons can be learnt from the experience of the Non-Fossil Fuels Obligation in designing such a scheme.

These contracts could be set up so that different sectors and technologies compete directly against each other on cost-effectiveness to ensure best value for money per tonne of carbon saved. In order for emerging technologies and further innovation to be encouraged it may be necessary to devise robust criteria for assessment of technologies. Those technologies which are judged to be 'market mature' could then compete with each other, while those which are immature could compete for contracts within a tighter 'development category', or they could receive graduated support in the form of subsidies or grants.

The credibility of such a mechanism would be enhanced, and therefore its costs and prospects for success improved, if a political consensus could be achieved to support it over the long-term.

2.5.1 Linking Public Finance Initiatives to carbon contracts

Public Finance Initiatives have been used for the provision of large-scale energy services and CHP schemes in the UK. In 1997, the concept of Public Private Partnerships (PPP) was extended to services associated with local authority housing. Future PFI and carbon contract auctions could be co-ordinated, so that potential energy-related PFI projects with significant carbon savings could factor in the potential carbon revenue from government to offset costs and therefore lower the long-term public liability cost to taxpayer. If their emission reduction price proves competitive against supply side proposals in a carbon contract

[11] D Helm (2005) A new British Energy Policy, Social Market Foundation.

auction, the PFI tender would then be judged with the cost of carbon factored in.

This may allow for greater domestic and public building, energy efficiency, retrofit and CHP deployment that would otherwise be the case.

2.6 Energy Efficiency

Experience to date and evidence on the potential for energy efficiency points to a step change in effort as an outcome of this review. As the Energy White Paper 2003 states '*the cheapest, cleanest and safest way of addressing our energy policy objectives is to use less energy. The financial benefits of doing so are clear*.'

Most of the measures so far undertaken save more than they cost, strengthen the economy, improve welfare and reduce import dependency. There is a large untapped reservoir of such savings still to be realised in buildings, transport, industry and the commercial and public sector. Capturing these opportunities is a central challenge for the new energy policy.

In 2002 the Prime Minister's Performance and Innovation Unit (PIU) assessed the potential for energy efficiency. The PIU found that cost effective measures could reduce energy demand by 30% across the whole economy, resulting in savings of 40 MtC per year. This level of potential is consistent with others' findings:

- The recently published EC Green Paper 'A European Strategy for Sustainable, Competitive and Secure Energy' identified action on energy efficiency as a vital for ensuring a competitive and sustainable EU economy. It is estimated that efficiency measures could reduce energy demand in 2020 by 20% across the EU.
- Lovins[12] has also comprehensively demonstrated the huge potential that exists in energy efficiency measures both in terms of carbon and cost reductions. Large companies such as Du Pont, IBM and BP have all made dramatic energy savings motivated by financial gains. BP achieved a 10% reduction in greenhouse emissions 8 years ahead of the 2010 target year, with a net-present-value saving of £650 million.

Analysis in more recent studies such as the 2005 Energy Efficiency Innovation Review (EEIR) has identified nearly 21 MtC of cost-effective savings possible by 2020[13].

The vast majority of the potentials outlined above are cost effective measures – if energy efficiency potential were to be evaluated on an equal basis against other more expensive ways of achieving carbon reduction the potential would be much greater still. They will also be greater against recent higher fuel prices.

What is clear from the extensive analysis that has been done on the potential for energy efficiency is that this sector provides by far the greatest potential for

[12] Lovin AB (2004) Energy Efficiency Taxonomic Overview, *Encyclopedia of Energy* 2:383-401; http://www.rmi.org/images/other/Energy/E04-02_EnergyEffTax.pdf

[13] Energy Efficiency Innovation Review: Summary Report, Defra, December 2005

carbon savings at the least cost. Realising this potential will be essential if we are to achieve carbon savings on the level required by 2020 and over the longer term.

2.6.1 The success of energy efficiency measures to date

The energy intensity of the UK economy- the amount of energy consumed per unit of economic growth- has reduced dramatically over the last 30 years. Improvements have been at a rate of 1.8% each year. These improvements have played a very significant role in limiting CO2 emissions. The energy efficiency of UK homes has doubled since the 1970s reducing CO2 emissions by 28 MtC per year. This is three times the savings from the whole UK nuclear industry and is almost as much as the emissions of all the UK's coal power stations put together. At the same time consumers are estimated to have saved £10 billion from these efficiency improvements.[14]

Savings made through efficiency can potentially be undermined if the person then consequently chooses to use more energy or decides to spend the money saved on other energy consuming goods – this effect is termed the rebound effect. Actual measures of the rebound effect depend very much on the devices that are being considered. Efficiency improvements in household 'white goods' generally exhibit no observable rebound effect. Research done by the Congressional Research Service in the US has shown that overall improvements to efficiency of home devices result in energy savings 10-40% less than anticipated.[15] The rebound effect can at least partially be overcome through policies which engage consumers, and incentivise them to alter their behaviour.

Efficiency has formed the backbone to the successes of the Climate Change Programme Review. The revised Climate Change Programme shows that efficiency measures account for around 75% of the reductions in CO2 from projection levels, which is equivalent to just over 12.8 MtC by 2010[16]. Among the main contributing policies in the business sector are the Climate Change Levy and the Climate Change Agreements. In the domestic sector key policies are EEC and building regulations.

Energy efficiency policies also offer the greatest value for money in terms of cost per tonne of carbon avoided. All efficiency policies have positive net benefits ranging from small overall benefits to £540/ tCO2. The overall financial saving resulting from the climate change programme is £80 billion[17].

2.6.2 Barriers to uptake

There are a number of reasons which explain why apparently attractive energy saving opportunities have not been realised:

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[14] Energy Saving Trust http://www.est.org.uk/aboutest/publications/eeirsummary/

[15] CRS (2001) Energy Efficiency and the Rebound Effect: Does Energy Efficiency Decrease Demand?
http://ncseonline.org/nle/crsreports/energy/eng-80.cfm?&CFID=11262148&CFTOKEN=7028302

[16] HM Government (2006) Climate Change; the UK programme 2006,
http://www.defra.gov.uk/environment/climatechange/uk/ukccp/index.htm

[17] Synthesis of Climate Change Policy Evaluations (April 2006),
http://www.defra.gov.uk/environment/climatechange/uk/ukccp/pdf/synthesisccpolicy-evaluations.pdf

- Lack of interest - for many companies, outside of the energy intensive industry, energy is a peripheral resource and is not considered an area of significant cost savings potential.

- Up front costs - SMEs often lack the up front resources to invest in energy savings technology even where they have identified cost savings.

- Hidden costs - such costs are additional to the up front cost of energy efficiency devices and technologies. For example, there may be search costs as a result of time spent gathering information and identifying opportunities. These costs can be minimised through well directed information campaigns and advice to both home owners and small businesses who do not have the research or management capacity to 'seek out' saving possibilities.

- Split incentives - there is often a split between the tenant (who pays energy bills) and the owner of a property (who has the power to make efficiency alterations). This results in there being no clear incentive on any one party to improve the efficiency of the building.

Through carefully targeted policies, experience has shown that these barriers can be overcome. Policies must be designed in order to ensure that these barriers are addressed in the most efficient manner.

2.6.3 Recommendations on energy efficiency

Many of the programmes to date have been small scale and we can be much more ambitious in the future. Improving energy efficiency should be at the centre of any new policy on energy. We need to build on the work and recommendations of the Energy Efficiency Innovation Review and think through how we can move to a much more energy efficient economy placing energy efficiency concerns at the heart of energy suppliers goals.

Some of the realisation of the energy efficiency potential will require behaviour change. We recommend that the review adopts the broad approach to behaviour change set out in the Government's sustainable development strategy – using a range of measures to *engage, enable, encourage and exemplify* in order to catalyse a step-change and encourage and empower people, businesses and the government itself to jointly achieve our shared objectives. We have listed our recommendations on energy efficiency under these four broad headings below:

Engage - involving businesses and people

Recent opinion polls suggest that information and awareness campaigns are having a significant impact on the publics understanding and concern for environmental issues including climate change. A recent survey by the Tyndall Centre showed that 62% of people believe climate change to be so serious that every possible action should be taken tackle it. A further 32% want some kind of action taken. The available evidence also suggests that the public appetite for fiscal incentives has grown. A recent Guardian ICM poll showed that 63% of people said they would approve of a green tax to discourage behaviour that harms the environment. In contrast to many previous studies the poll indicated

that the majority of people would be willing to pay more for environmental benefits even without associated cost savings.

There are a number of ways that we can build on this awareness and engage with individuals and businesses. It will be important that the various campaigns sending messages to consumers and businesses are as joined up as possible. Awareness raising needs to be linked with the other corners of the Sustainable Development diamond if it is to successfully result in changing behaviour:

Policy	**Recommendation**
Climate Change Communication Strategy	The Government's Climate Change Communications Initiative 'Tomorrow's climate, today's challenge', is to be welcomed. It is also encouraging to see that the Government's approach prioritises local initiatives through established networks - "taking the message of climate change right down to local and community level". Much of the campaign's success will hinge on the breadth and reach of initiatives supported by the £6million Climate Challenge Fund. We also support the implementation of a similar scheme in Wales.
EST and the Carbon Trust	In 2003-4 1.2 million customers contacted the EST for advice through their website, call centres and advice centres. It is estimated that the resulting energy saving measures will save over 1.1 MtC over course of their life times.[18] The Carbon Trust has also helped many companies to identify and achieve cost effective energy savings. In 2004-5 the Carbon Trust worked with over 2,800 organisations, resulting in emission savings of 2.7 Mt CO2, and cost savings of £200 million.[19] While much has been achieved by both organisations there still many households and businesses yet to reach. Evaluation has shown the effectiveness of these measures and they should be continued.
Community Renewables and Microgeneration	Micro-generation has a clear role to play in reducing carbon emissions. However, the potential impact of micro generation could be even greater. A recent study by the Sustainable Consumption Roundtable[20] showed that micro-generation can have other advantages. By increasing consumers awareness and understanding of energy generation people become more likely to use energy sparingly and sustainably. As the report states household and community on-site generation can 'significantly shift awareness, attitudes and behaviour'. These signals are encouraging and suggest the advantages of micro-generation could extend far beyond savings from 'kilowatts substitution' to behaviour change and demand management. Further research in this area will be needed to ascertain the nature and full extent of these linkages.
Metering	The installation of 'smart meters', which clearly display real-time consumption of electricity or gas, can have significant impacts on energy consumption. By making consumption information accessible and available people's awareness is raised and they are more likely to limit their energy

[18] EST Annual report 2003-4, http://www.est.org.uk/uploads/documents/aboutest/ESTAnnualReport2003-04.pdf

[19] Carbon Trust 2004-5, http://www.thecarbontrust.co.uk/carbontrust/about/publications/CarbonTrustAnnualReport0405.pdf

[20] SCR (2005) Seeing the light: the impact of micro-generation on the way we use energy Qualitative research findings:SCR 2005 http://www.sd-commission.org.uk/publications/downloads/Micro-generationreport.pdf

	consumption. It has been estimated that such devices can reduce energy demand in the home by 5-15%.[21] For this reason we welcome Article 13 of the EU Efficiency and Energy Saving Directive that is currently in the legislative process, which sets out requirements for smart meter uptake. However, more needs to be done to define minimal standards for smart meters to ensure all potential benefits are realised and a high degree of standardisation is achieved. It will also be necessary for the government to provide strong incentives and support, along with possible new legislation, to ensure the rapid uptake of such technology.

Enable- making it easier to make the right choices

Individuals and businesses need to have the right infrastructure in place to allow them to make the right choices when it comes to energy use. We recommend a number of further actions to ensure this infrastructure is in place:

Policy	**Recommendation**
Building regulations	Despite improvements, minimum standards of energy efficiency for new homes, set out in Building Regulations are still lower than many other European countries. We believe that Government should be using the regulations to set the construction industry a challenge to deliver zero carbon buildings as standard by 2020. By linking future levels in building regulations to the levels in the Code for Sustainable Homes, as set out below, the industry will have a clear understanding of the standards it will have to build to in the future. This will enable them to plan changes to practices and institute training programmes.
Code for Sustainable Homes	We believe that the minimum Code standard should always exceed any relevant regulation. The current draft Code does not always achieve this, especially in the area of energy efficiency. For the Code to have any credibility, the minimum standard for energy efficiency at Level 1 should be at least 5% above Building Regulations Part L1A 2006, with higher levels of the Code consistent with the EST Best Practice standards. The highest level of the Code should be to deliver a carbon neutral home. Government funded construction projects should be adhering to the Code Level 3. EST have recommended that the energy performance standard for Level 3 should be 25% improvement on Building Regulations Part L1A 2006. Such improvements, if combined with a 25% improvement in water efficiency, would deliver savings of £138/year in running costs of the home[22]. There will also need to be incentives to encourage more private developers to adopt higher levels of the Code. These could take a number of forms. Planning authorities could be encouraged to require developers to build to higher Code standards in environmentally stressed areas. Fiscal incentives could be given to developers for building to the highest Code level, or an obligation could be placed on house builders to build a proportion of all homes to the highest Code level. As a market based instrument, this would be flexible and provide certainty of carbon savings. It would also drive down the cost of new technologies.

[21] EST (2005) Smart Meters http://www.est.org.uk/partnership/energy/lead/index.cfm?mode=view&news_id=496

[22] Sustainable Homes – The financial and environmental benefits, Environment Agency 2005

Energy Performance in Buildings Directive	We look forward to the introduction of the Energy Performance in Building Directive (the EPBD) in 2007. This Directive has the potential to make significant improvements to UK building standards. In particular the introduction of compulsory energy certificates will go a long way to overcoming the gap between the responsibility and interests of tenants and landlords. However, there are issues around the implementation of this policy, and it is vital that the government takes as wide a view as possible of the term 'public building' so that as many buildings as possible can be covered by the regulation. We support the Carbon Trust's suggestion of extending the definition to include all large buildings visited by the public- not just public sector buildings. In order for Building Regulations and the EPBD to be successful it is essential that the concerns that have expressed over enforcement are addressed. The government should assess the need for more resources to be put into capacity building through the training and recruitment of building inspectors.
Information Packs for Homes	The introduction of Home Condition Reports in 2007 could be used as a trigger for stimulating more investment by individuals in the energy efficiency of their homes, particularly if backed up by fiscal incentives.
Products standards and labelling	The work of the Market Transformation Programme has already demonstrated the value of product policy in reducing CO2 emissions. Within 5 years, the improvements in performance brought about by MTP's involvement with just five products could save the same amount of energy as that used by at least 1.5 million homes[23]. Building on the success of current work carried out by the Market Transformation Programme and the Energy Saving Trust Government should continue to focus on the substantial savings that can be made through raising product standards and labelling. This approach should be extended to business and public sector related products.

Encourage- giving the right signals

Government needs to put in place the framework to send the right financial signals to businesses and individuals to take the actions that we want them to take. We have a number of recommendations for the measures that government could take to put in place this framework:

Policy	**Recommendation**
Putting a price on carbon	We think there is great potential for a step change in energy efficiency in the economy, and it is essential that large-scale energy efficiency investment programmes are able to compete on their merits with other technologies to control carbon emissions. Energy efficiency should be allowed to compete against supply options in any future carbon mechanism such as carbon contracts. This would ensure the greatest carbon abatement for the lowest cost. We are confident that if such a mechanism was to be introduced

[23]More information about the Market Transformation Programme can be found at www.mtprog.com

	efficiency measures, would be shown as highly attractive. Government would then need to participate in international mechanisms and put in place national policy measures to recoup the costs of these contracts and ensure a market price for carbon. These measures need to be designed to be cost effective and to address barriers to energy efficiency in each sector.
EU Emissions Trading Scheme (EU ETS)	The EU ETS *is* central to UK, EU and international climate change policy. In the UK, the scheme is already identified as a central plank of the revised Climate Change Programme. UK sites are expected to deliver carbon dioxide savings of 65 Mt over the three years of phase I of the EU ETS (2005-7). An important early indication of success is that we have seen a number of positive statements from industry bodies on the scheme[24]. Their calls for longer-term signals on emissions caps and the shape of the EU ETS shows that industry is accepting the need for deeper cuts in greenhouse gas emissions and its role in delivering them. Already the carbon market has shown itself to be a liquid one with the number and size of trades growing. 263 million allowances were traded in 2005 and in total, the market is now estimated to be worth over €5.4billion[25]. However, Phase I is only a first step towards a fully mature scheme. The near business as usual allocations made by most Member States[26]; allowance prices in the region of €25; the uncertainty about phase II targets and the potential use of JI and CDM credits to achieve compliance means that we will not see significant UK investment in low carbon technologies during Phase I. These factors need to be addressed in Phase II in order that the EU ETS helps deliver the step change necessary to achieve a low-carbon economy in the UK. In addition there is a need to harmonise the rules of the scheme across the EU 25 to minimise market distortions that could disadvantage UK industry. Therefore, we recommend: – *Phase II cap* - We should look to achieve real environmental improvements in phase II of the EU ETS and implement a cap towards the tighter end of the range currently being consulted on. For future rounds of the EU ETS the process for ensuring transparency of national allocation plans needs to be improved at the European level and we recommend that the UK Government should explore whether there would be benefit in setting future caps at the EU rather than member state level. – *Coverage* - There is limited scope to modify the current Directive to include additional sectors and gases in the scheme for practical reasons such as the number of small players or uncertainty about emission levels. However, the aluminium, coal mining and parts of the chemicals sector do provide some potential to expand the scope of the scheme which would increase the current CO_2 equivalent coverage of the scheme by an estimated 9%. We welcome the government's commitment to bring aviation into the EU ETS from 2008, or as soon as possible thereafter. Government should continue to investigate the potential for the scheme to

[24] See for example statements by William Kyte in Environmental Finance Online, 24 November 2005 and presentations at the Chatham House Conference "Emerging Carbon Markets: Can they Deliver?", June 2005.

[25] Carbon Market Europe pointcarbon analysis, see www.pointcarbon.com

[26] Analysis of the National Allocation Plans for the EU Emissions Trading Scheme, Dian Phylipsen et al (Ecofys) June 2005 and Survey of National Allocation Plans and The Environmental Effectiveness and Economic Efficiency of the European Union Emissions Trading Scheme, Öko Institute (for WWF), November 2005.

	be widened to cover a broader section of the economy over the medium term (post phase III). – *Domestic offsets* - Given the limited potential to expand the EU ETS to cover additional sources of greenhouse gas emissions in the short-term the UK Government should investigate the potential for domestic offsets schemes for those sectors that are not yet covered by climate change policies, for example agriculture and land use. – *Longer term certainty* – In order to provide clear signals to businesses about the value of carbon investments UK Government should continue to press for longer term certainty on future caps, allocation methodologies and coverage of the scheme.
UK Emissions Trading Scheme	The Carbon Trust has recommended that a new mandatory UK consumption based emission trading scheme is introduced to cover large non-energy-intensive companies (that are not included the EU ETS). This scheme would be restricted to companies with half-hourly meters (the larger electricity consumers) and would improve monitoring, transparency, and energy management with the aim of realising some of the cost effective savings that exist in this sector. Allowances within the trading scheme would be 100% auctioned with compensatory CCL rebates. We support further action in the commercial and public sector as an area that is not well covered by existing policies and one which has shown to have significant potential for cost effective energy efficiency. We welcome the proposals for a new UK ETS scheme. We acknowledge the care being taken to fully evaluate the criteria for inclusion in the scheme to minimise the regulator burden and a phased approach starting with the larger players may be the best way to minimise any overheads. The criteria for inclusion should aim to be at least cost neutral for the majority of participants, taking into account the potential for cost savings by improving energy efficiency and reducing energy demand. We believe this scheme has considerable potential to secure significant reductions in CO_2 by indirect means thus making a valuable contribution to the achievement of domestic targets as set out in the Energy White paper. Furthermore, the proposed scheme could be a driver for improving UK business competitiveness.
The Climate Change Levy (CCL)	The Climate Change Levy and associated Climate Change Agreements have resulted in significant savings to date. We welcome the announcement in the 2006 Budget that from 2007 and the Climate Change Levy will increase in line with inflation, though there is a good case to increase it in line with the growth of the economy. Whilst we support the introduction of a UK ETS for the larger organisations in the commercial and public sector it is likely that for the smaller organisations, the CCL will continue to be the primary policy mechanism to internalise the price of carbon and incentivise change for these sectors. To properly reflect environmental impacts, the CCL should be reformed to reflect carbon rather than energy content.
The Energy Efficiency	The Energy Efficiency Commitment has been one of the most effective policy measures put in place under the climate change programme and is one of the

Commitment	main mechanisms for realising these savings. Energy companies have responded well to the scheme and consistently met targets set. Government should continue to look at how this scheme can be strengthened in the future. Areas that could be improved include: – Targets and long term messages from Government about the future of the scheme – energy suppliers often meet their targets early leading to a stop / start nature of programmes run under the scheme – The lack of a whole house approach to improvements – often a singe measure such as Cavity Wall Insulation is installed – it would be much better to install a suite of measures and adopt a whole house approach – The cross over with fuel poverty objectives – the high percentage obligation to install measures into fuel poor households leads to confusion in delivery of the scheme. – Many of the savings to date have been made in the social sector. The challenge now is to achieve similar progress in the owner occupier and private landlord sectors. In the short term a tight cap for EEC III and less of a focus on fuel poverty with instead further, separate policies to address these goals would help address a number of these issues. Over the longer term (post 2011) the Government should consider the benefits of evolving ECC into a domestic cap and trade scheme. This could help stimulate an energy services market which would help to promote a focus on a whole house approach as well as expand the eligibility for the range of measures qualifying to measures such as microgeneration.
More research needs to be undertaken to understand the links between the trading schemes discussed above to look at how they could work along side each other, to maximise cost effectiveness and to minimise double counting of emissions.	
Penalising unsustainable behaviour and rewarding sustainable behaviour	Fiscal instruments should be used to penalise behaviour that is environmentally damaging and reward that which is environmentally beneficial. By introducing inefficiency charges for products that are least energy efficient, the price will more accurately reflect true environmental cost of that product. Additionally such a measure would have the added benefit of an awareness-raising effect as it would be visible, attracting media attention and generating discussion. The products that qualify for such treatment should be determined through a detailed government review. However, likely products to be targeted include B and C-rated appliances and incandescent light bulbs.[27] As well as product charges on damaging products, Government could vary the rates of existing taxes to encourage the purchase of sustainable options. This principle is already used on fuel duty, Company Car Taxation and on Vehicle Excise Duty. Once the Home Condition Report requirement, which will contain energy efficiency information, comes into force then the Government could use fiscal incentives to encourage more efficiency investments. The time of selling or purchasing a property is when many home owners will be considering making improvements to their home. The option of offering council tax rebates as an incentive to undertake energy

[27] Policy Studies Institute (2006) A Green Living Initiative: Engaging Households to achieve environmental goals

	efficiency measures in the home should be given serious consideration. A recent report published by the EST shows that tax exception offers an effective incentive for people to take action[28]. A small scale trial project involving around 500 households by Braintree District Council in conjunction with British Gas has shown that this approach can be very successful at engaging and motivating people. If such a scheme was implemented nationally the benefits could be very significant.

***Exemplify*- the Government must take the lead to demonstrate best practice**

Policy	***Recommendation***
Government estates	The Government's approach to sustainable public procurement is patchy, as demonstrated by the recent Environment Audit Committee review and National Audit Office reports. Government's Sustainable Procurement Task Force has created an opportunity to address the shortcomings identified. It is clear from evidence gathered by the Task Force that there is a great deal of scope for improvement in energy efficiency. For example, current "Quick Win" standards that predominantly relate to energy efficiency issues are often ignored and despite ministerial commitments a mere 17% of public sector buildings meet BREEAM excellent standards[29]. Unpublished research for the sustainable consumption roundtable shows that 56% of CO2 emissions attributable to the public sector arise off site in its supply chain. As such more work needs to also be done by procurers to promote energy efficiency with public sector suppliers. The Sustainable Procurement Task Force has identified priority expenditure areas for action across the Government both at the national and local level. The next step is for Government to set mandatory minimum standards against each priority area linking to key sustainability impacts including energy efficiency. The minimum standards set need to show aspirational standards into the future that buyers will progress to over the short to medium term. This approach will then send clear signals to the market to develop products that meet future requirements, therefore ensuring a continuous improvement culture in energy efficiency linked to key spend areas. At present "Quick Wins" are often focussed on white goods which are rarely bought by the public sector, it is therefore vital the priority areas identified by the Task Force are now focussed upon to ensure that the biggest areas of impact, have the highest levels of resource and action taken to deliver the best sustainable outcome.

2.7 Energy Supply

To promote low carbon energy supply we advise that Government put in place mechanisms to promote a price signal for carbon, such as carbon contracts, that will be sufficiently robust for investors to include in project finance appraisal without causing large distortions between competing low-carbon options. We are concerned about the displacement effect that a large programme of investment in

[28] EST (2005) Changing climate, changing behaviour; delivering household energy saving through fiscal incentives, http://www.est.org.uk/uploads/documents/aboutest/fiscalupdate.pdf

[29] Building Research Establishment www.breeam.org

one capital-intensive technology like nuclear may have on energy efficiency, CHP and renewable technologies. It will be crucial that new mechanisms to promote low carbon energy supply are open to all technologies and able to support low-carbon options for electricity, heat and combined heat and power markets. Although we support the principle of allowing different low carbon technologies to compete on cost-effectiveness, this can only be the case when technologies are at an equivalent level of market maturity. Additional graduated support must be available to technologies at the earlier stages of development.

The review will be a major test of the Government's Sustainable Development strategy, launched by the Prime Minister in February last year. All environmental impacts should be considered and a system-wide approach taken to minimising unsustainable and intergenerational environmental impacts. All technologies will have some environmental impacts. We need to be clear about the relative impacts between the options and seek to minimise these impacts as far as possible.

Technologies should be required to pass an environmental and safety threshold before they can then compete for carbon credits against each other. In this way the advantages of each technology can be tested against each other.

Our comments on specific supply technologies and what the environmental and safety threshold for each needs to consider are summarised below:

2.7.1 Renewable Energy

The Environment Agency supports the need to develop renewable energy technologies as part of a pathway to reduce carbon emissions by 60% by 2050. To promote innovation and development of this rapidly developing sector, we should encourage an environmentally sensitive adoption of renewables to work towards the goal of 20 per cent of electricity generation by 2020.

In its current form, the Renewables Obligation is proving to be an expensive way of securing renewable development. However, in order to preserve investor confidence in Government mechanisms and continue momentum on renewable energy development, we believe the Renewables Obligation should remain in place. Consideration should be given to a process of graduation for more mature technologies to support through a generalised mechanism, discussed above, that rewards low carbon characteristics.

We offer comments on specific renewables below where we have a role.

- *Biomass* - We support bioenergy as a renewable source of energy, however, adequate safeguards must be in place to minimise environmental impacts:
    - Whole life-cycle impacts of bioenergy should be assessed including net greenhouse gas emissions, environmental and biodiversity impacts and wider sustainable development contributions. The Environment Agency has developed a tool to enable environmental assessment of different biofuels.
    - Incentives such as grants, reduced excise duties or supplier obligations should be focussed on those technologies and fuels with low environmental impact.

- A certification and labelling scheme would enable consumers to choose biofuels with the lowest environmental impact and for any market support to be commensurate with environmental impact.

- *Marine renewables* - The UK has a large part of the Europe's marine renewable energy resources and we are well placed to exploit these energy sources. We support the development of these resources in a way that is sensitive to the local environment. The benefits of harnessing such energy must be carefully balanced against the environmental impacts caused by construction and operation of the devices.

  Whilst supporting the development of marine renewables more widely, we do not see a basis for changing current Government policy, which is that proposals for a Severn Barrage should not be pursued. We believe the nature and scale of proposals for the Severn Estuary would cause irreversible impacts to the internationally important habitats and ecology of the estuary. We cannot envisage how required compensation measures could be provided. We also have wider concerns relating to its implications for a number of other environmental considerations, such as water quality, water resources and flood risk management.

2.7.2 Microgeneration

The potential for microgeneration in the UK is large. The Energy Saving Trust recently concluded that 30-40% of the UK's electricity demands could be met through microgeneration technologies, with major contributions from CHP (both fuel-cell CHP and Stirling engine CHP), and micro-wind and some forms of solar power[30]. There are a number of benefits that a substantial contribution from microgeneration would bring:

- It would help improve the energy efficiency of the electricity generation system. Currently the UK's centralised system loses 61.5% of initial energy input due to inefficient generation and heat wastage. A further 3.5% of the energy is lost through transmission over long distances. Overall this means that around 65% of energy is lost before it reaches businesses, factories or homes[31]. By being located at point of use microgeneration helps to reduce transmission losses. Additionally, some microgeneration technologies also have high conversion efficiencies, for example, micro- CHP and small scale biomass heat can have efficiencies as high as 75 – 80%.

- Microgeneration can help to engage consumers directly in energy.

- Microgeneration technologies can help improve energy security as they represent a whole range of different technologies and fuels, most of which are renewable and plentiful in the UK. Micro – CHP and small scale biomass can also ease the burden on gas consumption by either

[30] Potential for Microgeneration Study and Analysis, Energy Saving Trust, November 2005

[31] Stytze Dijkstra of WADE for Greenpeace, Decentralising UK Energy: Cleaner, cheaper, more secure energy for a 21st century Britain, March 2006

using gas much more efficiently or providing an alternative energy source for heat.

We support a greater contribution from microgeneration in a way that is sensitive to the local environment. DTI should implement the actions listed in its microgeneration strategy as soon as possible in order to address the current barriers that exist to commercialisation of these technologies.

2.8.2 Decentralised Energy and Combined Heat and Power (CHP)

As well as improving the efficiency of end use of energy there are also substantial opportunities to improve the efficiency of the energy supply systems through more decentralised energy located near points of use[32] and increased use of CHP. This has been demonstrated in Woking, where actions taken by the local council have reduced the borough's CO2 emissions by more than 70 per cent between 1992 and 2004 by setting small generating networks up locally.

A report by PB Power[33], commissioned by the Mayor of London and Greenpeace UK, estimates that uptake of decentralised energy methods could deliver the capital's energy requirements without need for additional centralised power stations. This could reduce the capitals CO2 emissions by over 27% by 2025.

Government should continue to address barriers to decentralised generation in order to create a level playing field between decentralised and large scale centralised investors.

In order to support a greater take up of CHP government should:

- ensure CHP receives appropriate treatment in phase II of the EU ETS. This was not the case in phase I. In recognition of the associated efficiency advantages of CHP, the technology should be incentivised through the allocation process as has been done in other EU countries such as Germany.
- allow CHP to qualify for any new long term incentives for low carbon generation.
- use planning guidance as a way to ensure that CHP is incorporated into appropriate new developments.

2.8.3 Carbon capture and storage

We recognise that carbon capture and storage has the potential to significantly cut emissions during the production and use of fossil fuels. This could provide a bridging option that supports a transition from our current dependence on fossil fuels to a future with a wider range of sustainable energy choices. It is also likely to be an important technology globally as developing countries depend on coal to drive their emerging economies.

We welcome the publication of the Government's Strategy for Developing Carbon Abatement Technologies for Fossil Fuel Use and the work by

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[32] A recent report by Stytze Dijkstra of WADE for Greenpeace (Decentralising UK Energy: Cleaner, cheaper, more secure energy for a 21st century Britain, Greenpeace, March 2006) showed that Carbon emissions can be up to 17% lower in a decentralised rather that centralised scenario mainly due to savings in the transmission network.

[33] PB Power (2006) Powering London into the 21st Century: http://www.greenpeace.org.uk/

Government looking at this as an option for technology development. As the Strategy emphasises, CCS can only be part of the solution to climate change. It is only suitable for large point sources that make up about 35% of UK emissions.

We want to see carbon capture and storage technology achieve high standards of safety and environmental performance before it is used on a commercial scale. Effort and investment in energy efficiency and renewables should not be diverted for this purpose.

A sound regulatory framework for carbon capture and storage activities that adequately protects the local environment and human safety must be put in place and the other environmental impacts of burning fossil fuels need addressed to avoid high levels of associated emissions of acid gases, heavy metals and solid wastes.

We would like to work with the DTI to address potential environmental concerns early and put in place regulatory and monitoring arrangements alongside demonstration projects.

If it can meet these criteria, the advantages of carbon capture and storage should then be market-tested against other ways of achieving emissions reductions and energy security cost-effectively.

We will respond to the current Treasury consultation on commercial barriers to carbon capture and storage highlighting key issues we feel need to be addressed. In addition to the above these include:

- Clarification of how carbon capture integrates into providing protection for the environment as a whole under the IPPC Directive.
- A legal and regulatory framework for CO_2 storage, taking into account storage systems will likely extend under both land as well as sea. CO_2 would seem to be a waste under existing case law. Hence clarity and enabling changes are required in the following: EU legislation (EU ETS, Waste Framework Directive, Landfill Directive (Waste Acceptance Criteria), Groundwater Directive, Water Framework Directive) and the OSPAR Convention. Consideration should be given to having a single regulator.
- A risk-based technical framework needs to developed for monitoring CO_2 storage over thousands of years, utilising oil and gas expertise.
- Best available techniques (BAT) for new coal and gas build – we are currently carrying out a study to determine what represents the Best Available Techniques for new-build coal. This will report in early May and will look at how BAT relates to new plant being built, including making it carbon capture ready.

2.8.4 Nuclear

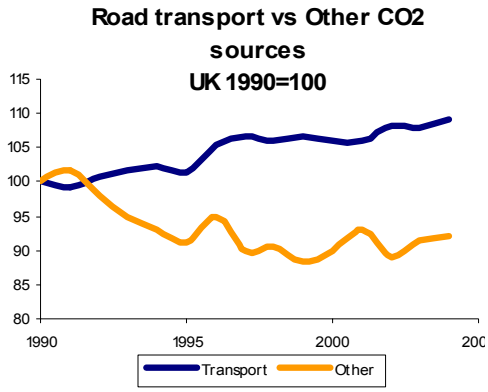
Our comments on nuclear are listed in our response to question 3 below.

2.9 Transport

The Energy White Paper should be clear on the contribution transport needs to make if we are to achieve 60% reductions in CO2 emissions by 2050. Transport

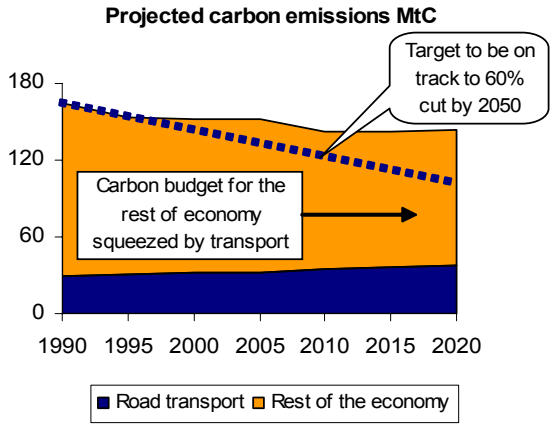
has not taken the same burden in reducing emissions to meet climate change targets, as have other sectors. While other sectors have made cuts in emissions since 1990, emissions from transport have increased. The government's projections[34] show road transport emissions accounting for a share of total CO2 – increasing from 18% in 1990 to 27% by 2020. In absolute terms, road transport emissions will have increased by 28% compared to 1990, when CO2 from the rest of the economy is projected to fall by 22%.

Figure 1. The rise in transport emissions



Source: DEFRA, E-digest: Global Atmosphere, January 2006

Figure 2. The transport squeeze on the rest of the economy



Source: adapted from DTI energy projections, 2004

The government needs to introduce a coherent environmental transport strategy that is consistent with its stated aims to reduce greenhouse gas emissions and to improve air quality and quality of life. Such a strategy would address fuels, vehicle efficiency, modal choices and the underlying demand for mobility.

As with energy efficiency we have listed our recommendations under the broad headings of the Governments Sustainable Development diamond:

[34] Department of Trade and Industry *Updated Energy Projections*, November 2004

2.9.1 Engage

Policy	***Recommendation***
Demand management: soft transport measures	'Soft' measures to help people choose to reduce their car use could produce CO2 savings of 0.5Mt/C per year.[35] They include: workplace and school travel plans, car clubs, tele-working, and home-shopping. DfT should require Local Authorities to give soft-measures high priority in their Local Transport Plans.
Vehicle Labelling	This scheme introduced last year to highlight the VED band and the estimated fuel cost should be made compulsory.

2.9.2 Enable

Policy	**Recommendation**
Alternative Fuels	We welcome the government's announcement to introduce a Renewable Transport Fuels Obligation (RTFO). A longer-term strategy is needed to take the UK beyond the 2010 target. Sustainability checks need to be built into the system, such as a labelling certification scheme that allows the fuels with the best environmental performance to be identified.

2.9.3 Encourage

Policy	**Recommendation**
Fuel Duty to internalise external costs and induce fuel switching	To stimulate long term changes in the pattern of use and design of vehicles it is important to have long-term signals that motorists and other transport users should expect rising costs to reflect the environmental impacts and imperatives to meet climate change objectives. Fuel duty may be used to create a price differential.
Vehicle Excise Duty to encourage better fuel efficiency	- We welcome the recent reform to the Vehicle Excise Duty as a good first step, although we recognise this is unlikely to strongly influence consumer behaviour. We support a more steeply graduated Vehicle Excise Duty system with wider gaps between the bands to encourage the purchase of lower carbon vehicles. DfT research shows that if there was a £300 differential between each VED band 72% of people would swap bands.[36]
Road Pricing	We welcome the initiative taken to start a national debate on road pricing. Until scarce infrastructure and road space are properly priced, they will be used inefficiently and excessively, with serious environmental costs. In any new system, it will be important not to scale back fuel duties to make road pricing or congestion charging revenue neutral, as this would tend to increase fuel use and pollution. A revenue-raising scheme could cut emissions by 8 per cent in the year 2010.[37]

[35] Sustainable Development Commission, Submission to the Climate Change Review, May 2005

[36] DfT (2003b) *Assessing the impact of graduated Vehicle Excise Duty: qualitative report*

[37] Glaister S and Graham D (2003) Transport Pricing and Investment in England. Research commissioned by the Independent Transport Commission.

Aviation	Aviation currently accounts for 3 per cent of UK CO2 emissions.[38] But due to the range of greenhouse gases emitted at altitude the proportion of climate change impacts accounted for by aviation is three times that of the equivalent amount of CO2 when emitted at ground level. Government policy, laid out in the Aviation White Paper (2003), is based on a 'predict and provide' approach. It fails to acknowledge that government policy should influence demand by applying sound 'Green Book' economic principles, such as the proper internalisation of externalities through taxes or capping emissions at a sustainable level. This approach would reduce demand and attenuate numerous environmental impacts. We welcome the government's commitment to bring aviation into the EU ETS from 2008, or as soon as possible thereafter. However, its success will depend on the approach to allocation of allowances. If no way can be found of covering aviation in the emissions trading proposals by 2008, the other measures such as an increase in Air Passenger Duty or an EU-wide emissions charge should be introduced with a commitment to reduce it when aviation is fully included within the ETS. Additional measures will be needed to address non-CO2 climate change impacts from aviation caused by nitrous oxides, water vapour and soot.

2.9.4 Exemplify

The government should lead by example by introducing policies to reduce emissions within its own government departments.

2.10 Innovation strategy

In order to continue to develop those low carbon technologies that are further from competing in the market such as offshore wind, microgeneration, the marine technologies and carbon capture and storage the Government will need to set out a clear innovation strategy for energy supply technologies with associated support policies. Innovation and delivery policies should generally be considered separately.

There is a need for a clear innovation strategy for sustainable energy that covers both supply and demand side measures.

2.11 The role of local authorities and regional bodies

Recent analysis of the role of local authorities and the English regions in reducing carbon emissions has shown a number of inter-related problems that are stifling activity at this level. First, although local and regional bodies have been described as having a 'key role' in mitigating emissions, there is no definition of what this role should be, nor any requirement to fulfil it. Second, because of this, action is fragmented and tends to be concentrated in small

[38] Joint announcement by the Department ofr Environment, Food and Rural Affairs and the Department for Transport. UK Welcomes European Support for Tackling Aviation Emissions, December 2005. http://defra.gov.uk/news/2005/051202b.htm

pockets of 'best practice'. These pockets appear to owe much to the presence of individuals with a positive agenda and thus questions have been raised as to how transferable these examples of action can be. Third, there is a lack of robust evidence to support an approach that would see requirements placed on local and regional bodies to reduce carbon emissions.

We would like to see more focus from Government on ensuring that emissions reductions are given a higher priority at local and regional level, in particular where it can lead to improvements in other priority areas, such as through energy efficiency measures to reduce public sector energy bills. If more evidence is required to support this approach then funding should be provided to gather it and to more effectively monitor action that is already taking place. Government should also examine ways to proactively enable national carbon reduction policies to be translated more easily into local policy and practice, rather than letting this happen in a piecemeal fashion. Local and regional bodies need guidance, information and hand-holding support beyond that currently provided by the Beacon Councils scheme and the IDeA to enable them to respond to this agenda.

The funds identified in the revised climate change programme will help but we think there is scope to go further. In particular, we are pleased that Government is currently considering including climate change in the Comprehensive Performance Assessment. We think this is an essential step forward.

We welcome the proposed new Planning Policy Statement on reducing the carbon emissions associated with the location, siting and design of new developments, which will also provide more formal structure to local authorities on their role in climate change.

3.0 QUESTION 2. WHAT FURTHER STEPS SHOULD THE GOVERNMENT TAKE TO DEVELOP OUR MARKET FRAMEWORK FOR DELIVERING RELIABLE ENERGY SUPPLIES?

Both the tight supply – demand margin and the subsequent price volatility of natural gas have been a significant concern for industry this winter. The Environment Agency has used a fast track administrative system to allow energy intensive industry the flexibility to switch to other less clean fuels subject to an appropriate justification and an assessment that environmental impacts were acceptable. These arrangements will not necessarily be available in future and operators should plan on this basis.

We recognise that significant levels of nuclear and coal capacity are due to come off stream between now and 2020 and this represents an opportunity to incentivise investment towards low carbon, lower environmental impact forms of energy generation. However, levels of coal fired plant now projected to come off stream by 2020 are lower than previously thought as following Defra's option to withdraw opt outs 5 GWe of plants have chosen to do so[39]. Government should make the most of this opportunity by giving long term signals to industry about

[39] Currently coal and oil fired power stations provide 28.3GWe generating capacity. Originally 54% (14.3GWe) had opted-out (meaning limited operating life and closure by end 2015). Since Defra gave the opportunity to withdraw opt-outs this has fallen to 33% (9.3GWe).

the future price of carbon as detailed in our response to question 1.

We advise that the best strategy for future energy security will be full exploitation of cost-effective energy efficiency to reduce demand for energy. We consider that there are considerable opportunities to reduce the demand for energy. The best form of energy security is not to need that energy in the first place. Implementing the recommendations in our response to question 1 and realising the full cost effective potential for energy efficiency out to 2020 would significantly reduce current energy security concerns.

In addition, UK Government and the European Commission should continue to push for open European energy markets with fair competition in order to promote more efficient distribution of available supplies and create a greater diversity of potential suppliers. As part of its external agenda, the EU should act in the common interest of all member states to secure good relations with critical suppliers outside the Union.

Energy security risks normally manifest themselves in price volatility rather than interruptions to supply. Different approaches to contracts and use of financial incentives to hedge against price rises could guard against this. Our recommendation is that if Government wishes to shield consumers from such price volatility then it should adopt market based solutions to energy security. These could be in the form of incentives on energy suppliers to invest in energy security, for example through demand management, additional reserve capacity, a greater diversity of energy sources, storage or long-term contracting. For oil, the UK attempts to maintain a strategic reserve of 90 days of imports as agreed under the auspices of the International Energy Agency in 2001. There is a compelling case to establish similar strategic reserve to stabilise gas markets. The grid operator could be given a duty to ensure sufficient redundancy and storage to maintain stability and dampen volatility, and recover costs through transmission tariffs.

Some of the causes of the difficulties this winter are already being addressed through greater diversity of sources, improved infrastructure and increased storage capacity. The environmental impacts from all responses to energy security concerns need to be considered. Responses that benefit both security and environmental goals, such as energy efficiency, should be considered as preferable. Other solutions may have environmental impacts that need to be taken into account and minimised. For example, short-term fuel switching to oil or increased use of coal fired plant. Given the environmental implications of fuel switching in terms of impact and detailed interactions with the regulatory framework, we welcome early consultation when contingency plans are being made.

Coal fired power stations have been utilised much more than expected in the last few years. They have a much higher environmental impact than gas. Any future build of the coal fleet will be to much higher environmental standards and the extent to which these offer an environmentally acceptable alternative to gas to deliver diversity in fuel sources needs to be considered. We are currently undertaking a study to determine standards for Best Available Techniques for new build coal and, will report in early summer. However, while the current pulverised fuel-fired systems have scope for improvement in terms of

supercritical steam cycles, boiler feedwater heating and increased biomass firing, there is a need to lay the foundations to move on. There is a need to clarify the legal framework for carbon capture-ready plant and carbon dioxide storage. Further Government and EC incentives to help demonstrate generically cleaner coal-firing technology (i.e. coal gasification) and carbon dioxide storage would help to get the transition started.

4.0 QUESTION 3. WHAT CONSIDERATIONS SHOULD APPLY TO NUCLEAR NEW BUILD?

The Environment Agency does not take a position for or against nuclear power. Nuclear installations need to achieve high standards of safety, security, environmental performance and waste management. If it can meet these criteria, the advantages of nuclear power in terms of carbon reductions and energy security need to be market-tested against other ways of achieving emissions reductions and energy security cost-effectively. We are concerned that if Government puts in place a programme of dedicated subsidy for nuclear new build, this could drain resources from investment in innovation and development of a whole range of promising low carbon options. These include energy efficiency, renewable energy and potentially carbon capture and storage. Instead we would advise introducing technology neutral support mechanisms to incentivise carbon reduction.

Nuclear power accounts for 8% of the UK's primary energy (20% of electricity generated). The success of the Energy Review will depend on developing a strategy for the other 92%, not least transport. It is important that we seek cost-effective greenhouse gas reductions across all sectors.

In considering a programme of nuclear new build we make the following comments:

- *Nuclear waste* - Before any new nuclear build can take place, the Government and the nuclear industry must design a waste management strategy that meets the tests of sustainability and public acceptability. Any programme of new build would add to the UK's existing nuclear waste inventory.

According to CoRWM's assessments, a fleet of 10 new AP 1000 PWRs would add only about 8% to the volume of the inventory. However, as most spent fuel from current reactors is reprocessed and is unlikely to be under a programme of new build, there would be a substantial increase in the quantity of spent fuel requiring long-term management, and the associated amount of radioactivity. The Government should therefore ensure that any new build programme would include a robust and effective management strategy for spent fuel. The Government should also openly address the issue of whether the UK's civil plutonium inventory (which might otherwise be managed as a radioactive waste) would be used in the nuclear fuel for any new reactors.

We welcome the fact that the Government has set up a committee, CoRWM, to develop options for dealing with nuclear waste and look forward to its recommendations in July.

- *Justification* - It is a legal requirement that new practices involving radioactive substances are 'justified' i.e. that the benefits outweigh the associated detriments. We are working with Dti, HSE and SEPA to consider the issues surrounding justification for new types of nuclear power reactors. We are also working with these organisations on streamlining licensing and authorisation processes.
- *Radiation* - In regulating disposal of radioactive waste we ensure that radiation doses to the most exposed individuals are within national standards and internationally agreed legal limits. Operators must use 'best practicable means' to ensure that radioactive waste is minimised and public radiation doses are as low as reasonably achievable. We will be comparing technologies for any new designs and looking for best practice to minimise waste and discharges.
- *Siting* - On the issue of siting of <u>any</u> new nuclear power stations, there are many factors which need to be considered. The management of flood risks is an important factor which we and HSE would have to consider, as we do for example in relation to a COMAH installation. If any applications are made for new nuclear stations, then we would advise on flood risk assessment. These would be on a site by site basis and take into account the growing scientific knowledge of risks of climate change on coastal sites, where most existing nuclear power stations are located.

- *Decommissioning* - We suggest that a proper segregated fund should be established to fund future decommissioning of any new nuclear power stations. This should be built up before the full, anticipated, operating life of the power station to fully fund decomissioning and waste management.

5.0 QUESTION 4 - ARE THERE PARTICULAR CONSIDERATIONS THAT SHOULD APPLY TO CARBON ABATEMENT AND OTHER LOW CARBON TECHNOLOGIES?

The review will be a major test of the Government's Sustainable Development strategy, launched by the Prime Minister in February last year. All environmental impacts should be considered and a system-wide approach taken to minimising unsustainable and intergenerational environmental impacts.

All technologies will have some environmental impacts. We need to be clear about the relative impacts between the options and seek to minimise these impacts as far as possible.

Our comments on ways to reduce impacts of specific technologies are listed in our response to questions 1 and 3. In particular we make recommendations about the development of biomass, carbon capture and storage and nuclear.

6.0 QUESTION 5 - WHAT FURTHER STEPS SHOULD BE TAKEN TOWARDS MEETING THE GOVERNMENT'S GOALS FOR ENSURING THAT EVERY

HOME IS ADEQUATELY AND AFFORDABLY HEATED?

Energy efficiency is the best way to achieve fuel poverty goals. It may be more helpful to consider fuel poverty measures separately to environmental goals, for example by separating out programmes of action from the Energy Efficiency Commitment and achieving the targets through separate mechanisms. For example, one way to tackle fuel poverty would be through variable charging. Extra profit from high consumption bands could then be recycled to directly fund energy efficiency measures for those that are classed as fuel poor. We also support the EST's proposal that the winter fuel payments are linked more closely to energy efficiency measures.

7.0 FURTHER CONSULTATION

As the current Government consultation poses only very broad questions on energy policy and does not set out specific policy proposals at this stage we advise that once the Energy Review team report in the summer Government should carry out further consultation on more detailed proposals for the way forward.

April 2006

Annex 1 – The Environment Agency's Role in Energy

The Environment Agency has a central role in respect of climate change and energy.

- We regulate industries under the Pollution Prevention and Control (PPC) regime that are responsible for 40 per cent of UK greenhouse gas emissions. These industries include major energy users and fossil fuel power stations.

- We act as the Competent Authority for the EU Emissions Trading Scheme (EU-ETS) in England and Wales. We are responsible for issuing permits to eligible installations and assessing compliance with the scheme's operational rules. The

- Environment Agency has led two EU-funded projects to help share experience on the implementation and shape Phases II and III of the EU ETS. The first project is designed to develop good practice guidance on implementation based on the experience of Competent Authorities during Phase I of the scheme[40]. The second is a LIFE Environment Preparatory project called LETS (LIFE Emissions Trading Scheme) Update[41], which is looking at the suitability of other sectors and gases in a future phase of the scheme and options for improving its harmonisation and design. The conclusions of the project will feed into the European Commission's review[42] of the EU ETS during 2006.

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[40] The IMPEL project is being carried out in two parts. Part A: A project to Identify Good Practice in the Implementation of the EU ETS was completed in December 2005. Part B: Options and Proposals for Harmonisation and the Implementation of the EU ETS is underway. This part will deliver good practice guides for regulators on the interpretation of the Directive and supporting guidance by January 2007.

[41] LIFE05/ENV/UK/PREP/12, see www.environment-agency.gov.uk/lets_update. The project is being led by the Environment Agency with the environmental protection agencies in Austria, Denmark, Germany and Italy.

[42] Directive 2003/87/EC requires that the European Commission present a report to the European Parliament by 31 June 2006 reviewing the success of the EUETS and, where necessary, legislative proposals for updating the scheme.

- Adaptation to climate change is critical to our operational functions, especially flood risk and water resource management. We are a lead partner in much of the regional adaptation work.

- We share regulation of nuclear sites with the HSE. HSE regulates nuclear safety, occupational health and safety and onsite radioactive waste management, whilst the Environment Agency is responsible for regulating the environmental impacts of nuclear power stations including disposal of radioactive waste and discharges into the environment.

- We support adoption of renewables and low carbon technologies. The Environment Agency regulates a number of aspects of renewable energy. We are consulted on planning applications. We administer Pollution Prevention and Control for larger biomass power and biofuel (liquid fuel production) plants. We license water abstraction for hydro power and for cooling water. And we monitor impacts on soil, water quality and resources and biodiversity (for example from fuel crop planting).

The composition of the future UK energy sector will determine whether many of the environmental outcomes we seek are achieved. We will have an important role in regulating and supporting many of the future energy supply technologies:

Environment Agency action - We aim to lead by example and have implemented a comprehensive environmental management system accredited to both ISO14001 and EMAS that limits the environmental impact of all our operations. Since 2000 we have reduced the energy consumption of our buildings by 17%. We are currently undertaking a fully comprehensive environmental audit of our energy use and are developing a new estate strategy that will ensure that we consolidate and build on the progress achieved to date. Already over 90% of the electricity we purchase comes from renewable sources.

We have produced our own Integrated Green Transport Strategy for Agency business travel in order to achieve a reduction in the Agency's direct contribution to global warming and poor local air quality. Our aim is a 50% reduction (from a 2001/02 baseline) in our total transport emissions from business travel by car by the end of March 2007. We are more than on course to meet this target. In addition our upcoming Internal Environmental Management Strategy 2007 -2011 will look to reduce our dependence upon fossil fuels. We will trial and use alternative fuels in our fleet.