



House of Commons
Environmental Audit
Committee

**Government Response to
the Committee's Sixth
Report of Session 2005–06:
Keeping the Lights on:
Nuclear renewables and
climate change**

**Second Special Report of Session
2006–07**

*Ordered by The House of Commons
to be printed 9 January 2007*

The Environmental Audit Committee

The Environmental Audit Committee is appointed by the House of Commons to consider to what extent the policies and programmes of government departments and non-departmental public bodies contribute to environmental protection and sustainable development; to audit their performance against such targets as may be set for them by Her Majesty's Ministers; and to report thereon to the House.

Current membership

Mr Tim Yeo, MP (*Conservative, South Suffolk*) (Chairman)
Ms Celia Barlow, MP (*Labour, Hove*)
Mr Martin Caton, MP (*Labour, Gower*)
Mr Colin Challen, MP (*Labour, Morley and Rothwell*)
Mr David Chaytor, MP (*Labour, Bury North*)
Mr Tim Farron, MP (*Liberal Democrat, Westmorland and Lonsdale*)
Mr David Howarth, MP (*Liberal Democrat, Cambridge*)
Mr Nick Hurd, MP (*Conservative, Ruislip Northwood*)
Mr Ian Pearson, MP (*Labour, Dudley South*) [*ex-officio*]
Mr Mark Pritchard, MP (*Conservative, Wrekin, The*)
Mrs Linda Riordan, MP (*Labour, Halifax*)
Mr Graham Stuart, MP (*Conservative, Beverley & Holderness*)
Ms Emily Thornberry, MP (*Labour, Islington South & Finsbury*)
Dr Desmond Turner, MP (*Labour, Brighton, Kempton*)
Mr Ed Vaizey, MP (*Conservative, Wantage*)
Joan Walley, MP (*Labour, Stoke-on-Trent North*)

Powers

The constitution and powers are set out in House of Commons Standing Orders, principally Standing Order No. 152A. These are available on the Internet via www.parliament.uk.

Publication

The Reports and evidence of the Committee are published by The Stationery Office by Order of the House. All publications of the Committee (including press notices) are on the Internet at: www.parliament.uk/parliamentary_committees/environmental_audit_committee.cfm.

A list of Reports of the Committee in the present Parliament is at the back of this volume.

Committee staff

The current staff of the Committee are: Mike Hennessy (Clerk); Sara Howe (Second Clerk); Richard Douglas (Committee Specialist); Oliver Bennett (Committee Specialist); Louise Smith (Committee Assistant); Caroline McElwee (Secretary); and Robert Long (Senior Office Clerk).

Contacts

All correspondence should be addressed to The Clerk, Environmental Audit Committee, Committee Office, 7 Millbank, London SW1P 3JA. The telephone number for general inquiries is: 020 7219 6150; the Committee's e-mail address is: eacom@parliament.uk

References

In the footnotes of this Report, references to oral evidence are indicated by 'Q' followed by the question number. References to written evidence are indicated by page number as in 'Ev12'.
number HC *-II

Second Special Report

Keeping the Lights on: Nuclear renewables and climate change — Government Response

1. The Environmental Audit Committee published its report on *Keeping the Lights on: Nuclear renewables and climate change* on Sunday 16 April 2006 as HC 584.
2. The Government's Response to the Committee's Report was received on Tuesday 3 October 2006 in the form of a memorandum to the Committee. It is reproduced as an Appendix to this Special Report.

Government response

GOVERNMENT RESPONSE TO ENVIRONMENTAL AUDIT COMMITTEE REPORT: "Keeping the Lights on: Nuclear renewables and climate change" (Sixth Report of Session 2005-06)

Overview

The Government is grateful to the Environmental Audit Committee for its wide-ranging inquiry and report into electricity generation. As the Committee has recognised, the last three years have seen unprecedented change in the energy policy landscape and a sharp rise in public interest in climate change and energy security against a backdrop of rising prices.

To address these challenges, the Prime Minister launched the Energy Review in November 2005 and the Review's conclusions were published on 11 July 2006 in "The Energy Challenge"¹. This document set out a large, ambitious evidence-based package of measures for further action on both energy supply and demand. It also announced further work on a series of long-term proposals and launched a number of consultations to develop policy further in some areas. The Review has proposed action on both the demand and supply sides to reduce carbon dioxide emissions and to ensure security of energy supplies.

On the demand side, we will undertake a major drive for households, business and Government to use less energy by, for example, phasing out inefficient consumer goods, improving the energy efficiency of new and existing housing, and taking forward work on a radical new idea to give energy supply companies incentives to reduce demand and therefore emissions from the home.

¹ See <http://www.dti.gov.uk/energy/review/page31995.html>

On the supply side, we will encourage all low carbon technologies by making a continuing strong long-term commitment to carbon pricing. We will boost renewable energy by strengthening the Renewables Obligation (RO), tackling barriers such as planning, and consulting on changes to the RO that would aim to bring on renewable technologies that are further from the market. We will also take steps to exploit the potential for ‘distributed generation’ which would enable us to generate energy efficiently near to where we use it. We will remove regulatory barriers to and reduce uncertainty for new nuclear investment. We will make further progress in laying the groundwork for the possible adoption of carbon capture and storage in the UK and elsewhere. We will bring forward a transport innovation strategy to help develop alternative fuels and technologies.

To ensure secure energy supplies, we will aim to maximise our own oil and gas reserves by boosting the attractiveness of investment in the UK compared to other regions of the world. This will help recovery from fields that are already producing and establish infrastructure to the west of Shetland for our undeveloped heavy oil resources. HM Treasury’s discussions with industry on the wider structural issues of the oil and gas fiscal framework will also be important.

We will ensure diverse sources of supply and reduce our gas dependence through energy efficiency, and improving the investment environment for distributed generation, renewables and nuclear generation. We will keep up international pressure to liberalise markets in the EU. We will manage the risks of increased reliance on gas imports by encouraging timely investment in storage and import infrastructure. We will work with industry to provide better market information and analysis to business and investors. And we will consult this autumn with both industry and energy users on the effectiveness of current gas security of supply arrangements.

If all the proposals, those that are firm and those which will be part of future consultations, were implemented we estimate that this could lead to carbon emissions being 19-25 Million tonnes of carbon (MtC) lower in 2020. Overall this would help us make real progress towards our 2050 goal. Our proposals also ensure the UK is in a better position to manage the risks associated with increased dependence on energy imports and give policy clarity to companies on the need for new investment in cleaner electricity generation.

Responses to recommendations (the Committee’s recommendations are shown in bold italicised type.)

Recommendation 1: By 2016, it is likely that between 15 and 20GW of electricity generating plant will be decommissioned. This amounts to nearly a quarter of total UK generating capacity. Over the next 9 years, therefore, very substantial investment in new generating capacity and energy efficiency will be required if the lights are to stay on—even in the absence of demand growth. Further substantial investment on a comparable scale may be required in the following decade. (Paragraph 15)

The Energy Review report—‘The Energy Challenge’—recognises the need for significant investment in energy infrastructure and generating plant.

It is likely we will need up to 25GW of new generating capacity over the next two decades, to fill the ‘generation capacity gap’ left by closing coal and nuclear stations and to meet future electricity demand. Given the scale of this challenge, the Review has undertaken detailed work to analyse the risks this could pose to our security of supply and to look at the cost effectiveness of a number policy options to mitigate these risks. The options investigated included different market-based mechanisms to encourage new build in a diverse set of generating technologies.

The analysis highlighted some risks around the market’s ability to continue

to deliver consistently the very high levels of security of supply that UK consumers and businesses have been used to. The level of risk will depend on factors such as expected fossil fuel prices, the growth in electricity demand and the expected pattern of closure of existing coal and nuclear power stations. The closure of coal stations will depend on individual company decisions, with stations that are not compliant with EU environmental legislation likely to close sometime after 2012 and certainly by 2015 when the EU legislation bites. The closure dates for nuclear stations will depend in part on whether some successfully achieve life extensions.

The modelling suggested that if most closure dates coincide, market participants may not be able to respond by developing and commissioning new power stations in a timely fashion. Under certain scenarios, this could lead to a reduction in the amount of spare capacity on the system to meet peak demand (i.e. when demand is highest in a day during winter). However, the modelling also indicates that in most scenarios, the risk of having unserved electricity demand is unlikely to become substantively higher than today until around 2015. Even then, the amounts of ‘shortfall’ between demand and supply are likely to be small and could therefore potentially be resolved by some companies voluntarily shifting their electricity consumption from peak to off-peak times in response to price signals.

Finally, it is important to recognise that the model does not take account of the proposals to clarify the Government’s position on renewables and nuclear and to streamline planning, all of which should help ensure the market brings forward new investment in a timely manner.

Recommendation 2: The Energy White Paper, published in February 2003, addressed the need for carbon reductions across the economy but did not set specific targets for the electricity generating sector. However, it endorsed the view set out in the PIU report that new gas-fired generating plant, renewables and energy efficiency could make up for the potential generating gap left by the decommissioning of older coal and existing nuclear plant. (Paragraph 18)

Government’s energy policy does not set specific sectoral targets for carbon emissions reductions, but rather it relies on using market mechanisms (and in particular, the EU ETS), taxes (e.g. the Climate Change Levy) and regulation to promote emissions reductions across the economy at least cost. The power generation sector is expected to play its role, along with a number of other sectors of the economy, as part of the UK’s efforts to tackle carbon emissions and the challenges of climate change.

Growth in the uptake of energy efficiency measures, combined with an increasing contribution from gas-fired generating plant and renewables, will help to offset the potential generating gap left by the closure of coal and nuclear power stations combined with the growth in energy demand. Current projections, which do not include the measures included in the energy review, show that renewable sources of electricity could increase from 4% of the generation mix currently, to around 13% by 2020, while it is projected that the share of electricity generated by gas could rise to around 55% by 2020. We do not expect new nuclear power to play a significant part until around 2020, subject to decisions by the private sector. Government does not determine the electricity generation mix: the role of government is to create the conditions in which the private sector makes investment decisions in the light of our public policy goals.

Recommendation 3: Following the Climate Change Programme Review and the current Energy Review, the Government should set targets for specific sectors of the economy including transport, the domestic sector, and the electricity generating sector for the level of carbon reductions to be achieved by 2020. It should also ensure that such targets, together with any targets set for absolute reductions in energy demand, are incorporated within departmental business plans and Public Service Agreements in order to ensure that policy development takes full account of the need to reduce carbon emissions. (Paragraph 22)

All sectors of the economy are expected to play their role in the UK's efforts to meet both our domestic and international targets for reducing carbon emissions. As the previous answer made clear, the Government's approach relies on the use of market mechanisms to promote emissions reductions across the economy at least cost. We see no reason at this time to change this approach. However, the Office of Climate Change is being set up to look into these kinds of questions.

Recommendation 4: We have serious concerns about the ability of the Government to model reliably and in a timely fashion, future energy and emission forecasts. This is reflected in the fact that the updated energy projections are two years late, the unwillingness to accept earlier that the Climate Change Strategy was seriously off course, and the difficulties which the Government experienced in setting an emissions cap for Phase 1 of the EU Emissions Trading System. As a first step, the Government should ensure that it puts in place a transparent and credible system for updating these forecasts regularly every two years. Ultimately, it would be more appropriate for some form of sustainable energy agency—clearly independent of government—to perform this role. (Paragraph 28)

Projecting energy use and associated emissions is intrinsically uncertain. These outputs depend on expectations at a particular point in time about the future values of variables included in the model, such as fossil fuel prices, future temperature and economic activity, all of which may vary. For example, recent volatility in energy markets has increased the

uncertainty range. All energy modellers face these uncertainties and the DTI model is no more susceptible than others. We deal with the uncertainties in a number of ways.

We provide a number of scenarios with corresponding projections of emissions reflecting a range of assumptions about the future. We have established an advisory group with external stakeholder involvement to help keep the assumptions under review, and have broadened consideration of uncertainties to include those related to model parameters as well as external drivers. This work was included in the Monte-Carlo analysis of the uncertainty in emissions provided in the Climate Change Programme. Few if any other countries take such a systematic approach. Steps on improving transparency and credibility are set out in more detail below. Given the importance of ranges we shall continue to consider how we present the results in future, particularly as the projections actually provide a view of the possible future levels and composition of energy demand based on a set of different scenarios of growth in the economy and of world fossil fuel prices.

The Committee is right that a full publication of projections, representing an update to EP68, was not available—as had been initially planned—for March 2004. However, a final set of UK projections, as used to inform the UK National Allocation Plan (NAP) for Phase I of the EU Emission Trading Scheme (EU ETS) was published in November 2004. More generally, the continuously evolving requirements for updated projections attached to the EU ETS, Climate Change Programme (CCP) and Energy Review have led to a series of updates—by way of consultations and publication—over the last couple of years.

The projections published early in July 2003 identified a gap against achievement of the Government's target to reduce CO₂ emissions by 20% below 1990 levels in 2010. The Government has looked seriously at measures to address the gap, through—for example—the Energy Efficiency Implementation Plan and the Climate Change Programme Review. The measures set out in the Climate Change Programme published in March 2006 will take us closer to achieving the domestic target.

The Committee refers to problems over finalisation of projections as a cause of the *difficulties which the Government experienced in setting an emissions cap for Phase I of the EU Emissions Trading Scheme*. This is incorrect. The issues that the UK faced in setting its Phase I allocation were largely a result of a misunderstanding between the UK and the European Commission about the status of the draft NAP submitted in May 2004.

The timetable to produce NAPs for Phase I was very tight. It required projections to a new and higher level of disaggregation than had previously been produced (or for which base data was readily available). The DTI set in hand a work programme to deliver a robust projection, but it became clear that this could not provide final projections, with public consultation, to the level of robustness required in time to meet the Commission's timetable. This was a general problem across Member States.

Consequently, the draft NAP submitted to the Commission in May 2004 made very clear that the allocation was provisional and subject to revision in light of continuing work. The modelling was also subject to revision to reflect renegotiation of Climate Change Agreements (not finalised in May 2004) and revisions to emissions factors. The

Commission was made aware of the status of the plan, but later chose to reject subsequent amendment.

Recognising the significance of energy and emission projections, including the substantial interest of EU ETS sectors, the Government has moved to improve the transparency and credibility of its systems for updating projections. This has included:

- consultations on key assumptions, such as fossil fuel price;
- consultation on provisional updated projections, prior to finalisation (whether for NAP purposes, or use in the CCP Review);
- extensive consultation with stakeholders which took place in deriving the EUETS projections for the Phase 2 NAP, which included an initial large stakeholder meeting followed by individual meetings with each sector to discuss specific topics;
- establishment of a Projections Advisory Group (PAG), in May 2005, to advise on assumptions and other modelling issues, and consider emerging results (www.dti.gov.uk/energy/environment/projections/PAG/index.html). The PAG comprises a number of external experts, nominated by a range of organisations with energy/emissions interests.
- Use of an independent Projections Panel of experts (<http://www.dti.gov.uk/files/file33219.pdf> (page 2-Role of the Panel)) to advise on Government plans for responding to projections issues raised by interested sectors feeding into development of the NAP for Phase II of the EU ETS.

We anticipate the need to integrate into the model the effect of the EU Emissions Trading Scheme on the UK economy

The Committee suggests that systems to allow for updating of forecasts regularly every two years should be put in place. The Government is committed, in the March 2006 Climate Change Programme, to an annual report on emissions, future plans and progress on domestic climate change. This should allow for an annual update of the position regarding CO₂ emissions projections which, it should be noted, will undoubtedly move as expectations about the future evolve and as the impacts of measures are reassessed.

Recommendation 5: There is little evidence as yet that the Government has succeeded in doubling the rate of energy efficiency improvements, as envisaged in the Energy White Paper. Indeed, given the importance the Government attaches to this objective, it is surprising that progress against the energy intensity ratio is not regularly reported and that it is not even included in the newly revised suite of 68 Sustainable Development indicators. The Government must address this glaring anomaly. (Paragraph 35)

Answer grouped with Recommendation 6—see below.

Recommendation 6: *The Environmental Audit Committee has highlighted on previous occasions the failure by Government departments—in particular, the Treasury—to take decisive action on energy efficiency. What is abundantly clear is that it will require a coordinated package of regulatory and fiscal policy instruments which offers much more in the way of both carrots and sticks, and that this must be accompanied by high-profile campaigns to raise awareness among the public. Far greater political leadership is required and far higher priority accorded to energy efficiency if the Government is to achieve the carbon reductions set out in the Energy White Paper. As part of such a strategy, we would also urge the Government to consider setting absolute targets for reductions in demand as a way of stimulating the growth of energy services and guaranteeing the level of carbon savings achieved. (Paragraph 40)*

Saving energy is key to meeting our long-term energy challenges. The 2003 Energy White Paper, the 2004 Energy Efficiency Action Plan and most recently the Energy Review place energy efficiency at the heart of our energy policy. Energy efficiency policies will deliver almost half of the carbon savings set out in our 2006 Climate Change Programme to 2010. We also believe energy efficiency can contribute at least a third of the additional carbon savings we need by 2020 and beyond. The new energy efficiency policies signalled in the recent Energy Review reinforce how integral energy efficiency is to our long-term energy vision.

We acknowledge that, counter to our objective, absolute demand for energy continues to rise at about 1.5% per annum due to changing social trends and greater wealth, amongst other things. However, it must be emphasized that it is only comparatively recently, under the UN Climate Change Convention and the Kyoto Protocol, that we have systematically worked to deliver improvements in energy efficiency as a means of delivering carbon savings and there is an inevitable delay before the full impact of policies can be seen and measured. We would not yet expect to see a doubling in the rate of energy efficiency—this is a 2010 target—but we are far from complacent.

Although it would deliver cost savings, businesses and households are not making the most of the full potential of energy efficiency, even with recent energy price increases. The Energy Efficiency Innovation Review, published in November 2005, summarised the reasons for this:

- lack of appreciation of the true costs and the long-term benefits of energy efficiency measures;
- market misalignment, due to regulatory failures, external budget constraints or split incentives (e.g. the tenant pays the energy bill so the landlord has no incentive to invest); and
- inertia, lack of interest, knowledge or awareness.

Our energy efficiency policies need to respond to different market failures in different ways. In some cases regulatory interventions (e.g. building regulations and appliance standards) can be the most effective and cost effective response. There is also a role for better information (e.g. product labelling), incentives (e.g. the Climate Change Levy and the exemptions from it available through Climate Change Agreements); and market mechanisms (e.g. trading). A package of measures will be the most effective approach.

If we are to increase energy efficiency across the board, all sectors of society will need to play their part. This means creating the conditions for people and organisations to change; demonstrating the benefits (such as saving money, and improving the environment); and making action easier. It also means continuing to support innovation in the technologies for energy use.

Since the 2003 Energy White Paper we have seen a continued strengthening of the energy efficiency policy package. We have measures in place to promote energy efficiency that, even before the Energy Review commitments, will reduce the UK's carbon dioxide emissions by over 7% by 2010 compared to 1990 levels.

The Committee recommended moving towards energy efficiency policies defined in terms of absolute demand reduction. In the Energy Review the Government has committed to extend an Energy Efficiency Commitment-type supplier obligation to 2020, and to explore the scope to move from 2011 towards a scheme based on absolute carbon or energy targets. Considerable further work is needed to develop this proposal, and it would require amendments to the current legislative framework for EEC. If delivered successfully it would give energy suppliers great flexibility in terms of the measures they employ to address household energy use and would open up new possibilities for energy services approaches. Work on this proposal is commencing in September 2006 with a stakeholder workshop to determine the detailed programme of research and analysis that will be required.

Other recent developments that address the Committee's concerns include the following.

- A concerted push to improve information on energy use to consumers (further information on these can be found in the Energy Review, paragraphs 2.37-2.57):
 - mandating, from 2007 onwards, improvements in the information provided in domestic customers' energy bills, requiring bills to provide comparative historic energy use, supported by information on energy efficiency;
 - consulting (in 2007) on introducing real time displays which provide instant energy consumption and cost information on electricity use (several companies are trialling these already);
 - A £9.75m trial on smart metering and consumption feedback including behavioural issues, while we continue to explore the costs and benefits for more sophisticated monitoring of energy usage.
- A concerted push to improve product standards through work at international and EU level and with manufacturers and retailers in the UK. We aim to remove the least energy efficient domestic lighting, consumer electronics, white goods, electric motors and office equipment from the market and to build markets for the best of them by setting a firm agenda to raise standards progressively (including a limit on stand-by power consumption), so stimulating innovation and competition in the supply chain (see Energy Review paragraphs 2.19-2.27).
- Recognition that there is potential to make additional savings from large commercial and public sector organizations. These are currently covered by the

Climate Change Levy. The Government will consult on options to tackle this sector including through a mandatory emissions trading scheme (see Energy Review paragraphs 2.65-2.70).

- A long term ambition to move towards carbon neutral development, with future building standards rising to track the performance levels of the Code for Sustainable Homes².
- Strengthened public sector leadership with a range of new energy targets for Government and a commitment to a carbon neutral Central Government estate by 2012³.
- The Government is also due to respond this Autumn to the Sustainable Procurement Taskforce which published its Action Plan in June.

The Committee also raised a specific technical point about the “rebound effect”. We can confirm that assumptions on the direct rebound effect (or comfort taking) are routinely included within the estimates of savings from energy efficiency policies (at around 30% for insulation for example). To enhance our understanding of the macro-economic rebound effect of energy efficiency improvements, we commissioned two independent studies – one from a Cambridge-based consortium and one from Strathclyde University. These found that the overall (direct and indirect) rebound effect for the UK, given existing (pre Climate Change Programme and Energy Review) energy efficiency programmes is around 25-40 per cent. The Cambridge consortium found a macro-economic rebound effect of about 11%. It therefore seems extremely unlikely that energy efficiency results in overall increases in energy demand. As an ancillary finding, the models have revealed a positive impact on the UK economy in terms of productivity and employment from improved energy efficiency. Copies of both studies are published on the Defra website⁴ and have been placed in the House Library.

The Committee also called for an energy intensity sustainable development indicator. We must emphasise that energy intensity is not the same as energy efficiency. To assess, evaluate and appraise the impact of energy efficiency policies, bottom-up approaches are most suited, whereby policy-induced savings can be estimated. Simple top-down approaches such as energy intensity of GDP are not so well suited as they conflate other issues such as economic changes (e.g. structural changes) and weather variation. The Energy End-Use Efficiency and Energy Services Directive also recognizes this, and therefore calls for the use as much as possible of bottom-up rather than top-down approaches. In principle, both bottom-up and top-down approaches should be consistent when all appropriate corrections are applied for each approach.

At the same time, our climate change targets can be expressed in terms of absolute carbon emissions: for example, in the housing sector, with existing and new policies, emissions

² See speech by Yvette Cooper, DCLG Minister for Housing and Planning, to the Green Alliance, 17/5/06. at: www.communities.gov.uk/index.asp?id=1500138

³ see Defra’s News Release at: www.defra.gov.uk/news/2006/060612a.htm

⁴ <http://www.defra.gov.uk/environment/energy/research/index.htm>

would be 35.3MtC by 2010. These are achieved by estimating where we will be in 2010 without policies, which equated to the business as usual scenario (BAU) and then 1) calculating savings beyond BAU; and 2) taking these savings from BAU. We recognise that this is a complicated means of deriving a final figure but it is necessary. A number of issues which affect consumption keep changing from one year to the next - incomes, energy prices, household numbers, weather, how warm homes are kept, hot water used, fuel mix, number and use of electrical appliances. All must be taken into account. The alternative proposed by the House of Lords Science and Technology Committee and which the Environmental Audit Committee reflects upon in its own report is not any simpler, as it would also need to allow for all these changes. Fluctuations from one year to the next in weather and energy prices might completely mask the effects of the policy from one year to the next. So we consider it better to look at the trends rather than placing too much emphasis on the individual figures in any one year.

We do, however, recognise a need to do more to make our procedures more transparent. We will report annually to Parliament on our progress at reducing the UK's greenhouse gas emissions, setting out our future work programme and examining options to reduce emissions.

The Committee also state that the effectiveness of the Energy Efficiency Commitment was unclear. Three reports on phase 1 of EEC (2002-2005) have been published. Ofgem, the scheme administrator, has published their report and Defra commissioned an external evaluation and has also compiled its own summary report. All of these are available via the Defra website⁵. These reports conclude that EEC phase 1 exceeded its targets, delivering measures which save 0.4 MtC per annum, saving consumers £9 for each £1 spent and reducing consumer bills by £3Bn over the period to 2020. Most low income households and more than 2 out of 5 of all GB households directly benefited from EEC1—mainly from appliances and lighting savings. The market for wet and refrigeration appliances has transformed, while the growth of condensing boiler sales and associated installation experience during the course of EEC1 gave the Government confidence to legislate through the Building Regulations to bring about market transformation in residential boilers.

The Government is committed to driving up energy efficiency across all sectors. We are aware of the considerable issues that still require attention given the scale of the challenge and we are committed to putting energy efficiency firmly at the heart of energy policy to 2020 and beyond.

Recommendation 7: The UK lags well behind almost all other EU-15 countries in terms of the percentage of electricity generated from renewables, and it is now certain—as indeed the EAC has been forecasting for several years—that the Government will fall far short of the 10% renewables target set for 2010. However, the evidence presented to us indicated that renewables can deliver 20% of electricity generated by 2020. In this sense, the vision set out in the Energy White Paper is still achievable, though it will require a far

⁵ <http://www.defra.gov.uk/environment/energy/eec/index.htm>

greater degree of commitment in terms of implementation than has hitherto been demonstrated. (Paragraph 49)

The 10% renewable target set for 2010 has always been ambitious and it is important to recognise that we are starting from a low base—just 1.5% in 2002. As part of our “business as usual” forecasts of energy market developments and CO₂ emissions—and to inform decisions on issues such as future CO₂ allocations under EU Emissions Trading Scheme we have published a figure of 8% of the UK’s electricity to come from renewable sources by 2010. In this context it is sensible to take a cautious approach and not assume CO₂ reductions we cannot guarantee. However, development activity, particularly for onshore wind, continues at a high rate with some 9000MW of onshore and offshore wind capacity either consented or in the planning system—more than enough to meet the Government’s 2010 target.

The Government’s key mechanism for supporting the development of new renewable generating capacity is the Renewables Obligation (RO). Since the introduction of the Renewables Obligation in 2002 there has been a step change in developments with renewable generation under the RO at 4% for 2005. The Government is committed to the development of renewable generation post 2010 and as part of the Energy Review announced a number of proposals for changes to the RO intended to provide more support for emerging technologies. These are banding the RO; extending the RO to 20% on a guaranteed headroom basis; freezing the buyout price in 2015/16; and the introduction of a mechanism to allow the tapering down of ROC prices once generation exceeds the level of the Obligation.

The Government has also announced proposals to work to accelerate access to the grid and to reduce delays to planning.

Recommendation 8: The retro-fitting of super-critical boilers could enable coal plants to improve their efficiency and contribute substantially to carbon reductions. More significantly, the development of carbon capture and storage (CCS) could reduce carbon emissions from coal-fired plant by 80%. Indeed, the Energy White Paper singled this technology out as being of such importance as to warrant an urgent 6 month research project to take it forward. It is scandalous that so little progress in developing clean coal and carbon capture and storage has been made, and even the flagship BP-led DF1 project at Peterhead remains dependent on the establishment of a long-term financial framework which would provide greater confidence to investors. (Paragraph 51 – 53)

It is not the case that little progress has been made in developing clean coal and carbon capture and storage (CCS) technologies, on the contrary we believe that substantial progress has been made since the publication of the Energy White Paper. The DTI’s Carbon Abatement Technologies (CATs) strategy, covering improvements in fossil fuel plant efficiency, co-firing with nominally carbon dioxide neutral biomass and CCS, was published in June 2005, and set out a detailed programme to support the technical development of these technologies as well as to address non-technical issues that could be barriers to full-scale deployment, particularly of CCS (eg. authorisation and regulation of projects, permitting under international treaties, entry into the EU Emission Trading

Scheme and public perception). The CAT Strategy provides support for industry-led R&D amounting to £20m over 3 years and an additional £35m of capital grants for demonstration projects. Additionally the CAT Strategy acknowledged that full-scale demonstration of the complete CCS chain would require a much larger financial support package, and this is why the strategy included an action to examine possible incentives for such a project. The Energy Review also concluded that CCS required full-scale commercial demonstration as the next stage of its development, provided this proved to be cost-effective. Consequently more work was needed on the costs of demonstrating these technologies and a statement will be made at the Pre-Budget Report on further incentives. The BP-led DF1 project at Peterhead is one of a number of potential CCS projects that could benefit from any such incentives.

Recommendation 9: Distributed generation could fundamentally alter the structure of electricity networks in the UK. Micro-CHP, in particular, could deliver at peak winter periods as much as the current fleet of nuclear power stations, and could be a key technology for addressing both energy efficiency and fuel poverty. We see no reason why it should not begin to contribute substantially by 2020 and would urge the DTI and Ofgem to take a more proactive approach in developing the microgeneration strategy. (Paragraph 62)

Distributed generation generally, and microgeneration in particular, could fundamentally change the way we meet our energy needs (for heat and electricity), contributing to emissions reduction, the reliability of our energy supplies and potentially to more competitive energy markets. The main advantage of the traditional system has been its ability to reduce costs through economies of scale. But a combination of new and existing technologies is opening up the possibility of accessing benefits at a regional or local level.

MicroCHP has already been targeted by Government as an important future technology. A reduced rate of VAT for microCHP installations was announced in Budget 2005 and during the second phase of the Energy Efficiency Commitment energy suppliers have been able to use microCHP as an 'innovative' technology in order to claim a 50% uplift. The Government has also been supporting the Carbon Trust microCHP field trials, however early results have not conclusively proved that microCHP units deliver carbon savings when installed in the domestic environment.

Microgeneration as a whole has been the focus of particular Government attention over the last 6-12 months, with the publication of the Microgeneration Strategy⁶ in March 2006 enhanced by the Climate Change and Sustainable Energy Act 2006 and the announcement of an additional £50m of capital grant funding for microgeneration in Budget 2006. The Energy Review stresses the continuing importance of microgeneration by confirming that the Government will aggressively implement the Microgeneration Strategy, taking advantage of the powers in the Climate Change and Sustainable Energy Act where appropriate.

⁶ See <http://www.dti.gov.uk/energy/sources/sustainable/microgeneration/strategy/page27594.html>

The Microgeneration Strategy outlines a number of actions the Government will be taking to develop a sustainable market in all microgeneration technologies. Key actions (the full list can be found on page 42 of the strategy) include the following.

- The allocation of £80m of capital grants through the Low Carbon Buildings Programme, including an innovative approach to spending the £50m tranche announced in Budget 06, which is aimed at achieving real price reductions.
- Helping microgenerators gain better access to the rewards for generating electricity, for example, easier access to Renewable Obligation Certificates and better rewards for electricity exported to the grid.
- Ensuring that, as far as possible, homeowners will be able to install microgeneration technologies such as solar panels and micro wind turbines without having to apply for planning permission.
- Reviewing the effectiveness of existing communications activity relating to microgeneration and identifying gaps.

The Energy Review acknowledged the important role Ofgem has to play in encouraging distributed generation. DTI and Ofgem have already undertaken a wide range of projects in this area, under the auspices of the Distributed Generation Co-Ordination Working Group (now the Electricity Networks Strategy Group), looking at issues such as connection terms, metering/trading and access to incentives for renewable generation. Ofgem have also recently formed a Microgeneration Forum to bring together key players from energy suppliers, network operators, the microgeneration industry and Government. The aim of the Forum is to identify and tackle regulatory barriers preventing the growth of microgeneration.

But the Government remains concerned to ensure that the overall impact of the regulatory regime is not to discriminate against distributed generation in any unjustifiable way. In this context the Energy Review announced that the Government and Ofgem would lead a comprehensive review of the incentives and barriers that impact on distributed electricity generation. This review will look at issues such as:

- The economic and other incentives on suppliers to buy electricity from distributed generators;
- The economic costs and benefits, and other incentives on Distribution Network Operators (DNOs) to connect new generators and invest in upgrading distribution networks in order to accommodate increasing amounts of distributed generation;
- The incentives on DNOs to engage in innovation aimed at minimising the costs and capturing the benefits of distributed generation; and
- Options for resolving potential barriers to the sale of electricity from small generators.

Overall the Government is taking a pro-active approach to the promotion of microgeneration and will continue to work constructively with Ofgem and all key stakeholders to ensure that microgeneration fulfils its potential as a source of heat and electricity.

Recommendation 10: *With the possibilities afforded by energy efficiency, renewables, distributed generation, and carbon capture and storage, it is abundantly clear that new nuclear build is not the only option for lower-carbon electricity generation within the UK. Indeed, the Government is spoilt for choice. It is all the more disappointing, therefore, that so little has been achieved since the Energy White Paper in developing these alternatives. The failure to do so will exacerbate the potential generating gap and will result in an even greater reliance on gas over the next ten years than would otherwise have been the case. (Paragraph 63)*

The Government has never claimed that new nuclear build is the only option for lower-carbon electricity generation. Neither do we think it is necessary for Government to make a choice between the various options, since all of them have potential to make a contribution and none of them should therefore be ruled out. Progress has been made since 2003 on a number of fronts.

- Despite recent increases in carbon emissions we have met our **Kyoto** commitments on greenhouse gases six years ahead of schedule.
- We have promoted the creation of a market price for carbon in Europe, through the mechanism of the EU Emissions Trading Scheme.
- We have helped to create a more **energy efficient** economy—there has been a 21% increase in GDP since 1997 but energy consumption has increased by just 2%.
- We have provided £500m for development of **renewable and low carbon technology** to supplement the support provided by the Renewables Obligation (RO) that, along with exemption from the Climate Change Levy, will be worth £1 billion per year to the renewables industry by 2010. There has been a leap forward in renewable electricity generation—from just 1.5% in 2002 when the RO was introduced, to 4% in 2005. Also in June 2005, the UK became one of only eight countries around the world to have installed over 1,000 MW of wind capacity.
- In March this year we published our **Microgeneration Strategy** and in the 2006 Budget, the Chancellor also announced £50 million of new funding for microgeneration, to be aimed mainly at public buildings such as schools and council housing, bringing total funding over the three years from 2006 to £80 million.
- The Carbon Abatement Technology Strategy was published in June 2005 and included proposals for increasing the efficiency of power stations to reduce emissions and for supporting the development of **Carbon Capture and Storage**; £35 million has been allocated to fund demonstration of these technologies. The 2006 Budget also included a consultation on the barriers to wide-scale commercial deployment of carbon capture and storage in the UK.

- We attracted £10 billion of commitments to new investment in gas import infrastructure, giving us access in future to a range of source countries for gas.

Recommendation11: *The past history of the nuclear industry gives little confidence about the timescales and costs of new build. This does not mean that a new generation of nuclear power stations cannot be built to time and cost, but it does mean that investors have little basis for assessing the risks involved and may therefore require a higher rate of return. (Paragraph 70)*

Any new nuclear build in the UK would be initiated, funded, constructed and operated by the private sector. We are taking action to remove uncertainty and delays in the planning and licensing processes to reduce the barriers to investment for developers. Actual costs of new nuclear will depend on (for example) contracts into which developers enter, and their cost of capital for financing the project. It will be for the private sector to take commercial investment decisions. (See also our response to recommendation 17.)

Recommendation12: *Nuclear can do nothing to fill the need for 20GW of new generating capacity which will arise by 2016, as it simply could not be built in time. The Secretary of State himself acknowledged that it might take 17 years before the first of a fleet of new nuclear power stations could become operational. Even if planning, licensing, and construction stages could be reduced to 10 years in total, the earliest possible date for the first of a series would be 2017—still too late to plug the immediate gap. For the period beyond 2017 nuclear could begin to make a contribution—though, given the fact that successive nuclear plants might only come on stream at perhaps 18 month intervals, it might not be until around 2030 that the full generating capacity of a nuclear programme would be available. (Paragraph 80)*

Government agrees that even with facilitating measures, new nuclear build is likely to make only a small contribution to carbon emission reductions and security of supply by 2020.

However, we also need to look towards our 2050 goal. Companies will be investing significant capital in new generating capacity over the next 20 years; we estimate around 30GW of new capacity will be needed in this period. We want new nuclear to be an option for some of that capacity.

Because generating assets are long-lived, for every new fossil fuel plant, we will be locking 20-40 years of higher carbon emissions into the UK economy.

If one new nuclear power plant, with a capacity of 1GW were in operation by 2020 and it was replacing a gas fired plant, it would reduce carbon emissions by 0.75MtC, which would be equivalent to 0.5% of our expected total carbon emissions in 2020.

Recommendation13: *Uranium mines can only supply just over half the current demand for uranium, and the situation is likely to become more acute as secondary sources—such*

as military stockpiles from decommissioned weapons—decline in importance. Such concerns, which are shared by the nuclear industry itself, may depress investment in new nuclear capacity, while the possibility of further large rises in the price of uranium could significantly alter the economics of nuclear power and render it less attractive to investors. (Paragraph 89)

The Energy Review Report acknowledges that realising the potential benefits of new nuclear build would naturally be dependent on the availability of fuel. The range of assessments of future prospects for uranium supplies reflects the difficulty of making exact predictions, in exactly the same way as predictions of future oil and gas reserves are complex.

Predictions on how long uranium deposits will last in any given country are dependent on a number of variables:

- the number of new mines and the rate at which they come on stream;
- the price of uranium ore. The price affects the mining market and may make mining of certain deposits more viable;
- new nuclear reactor technology may use less uranium thereby extending the lifetime of available uranium deposits;
- more nuclear reactors may be built globally, thereby increasing the demand on available uranium deposits; and
- increased use of reprocessing to recycle used fuel and create MOX (Mixed Oxide) fuel (a mix of uranium and plutonium) will require less uranium.

Every two years, the IAEA and NEA undertake a comprehensive assessment of the availability of uranium, taking into account expected production and demand levels. Their most recent report estimates the identified amount of conventional uranium resources that can be mined for less than USD 130/kg (just above the current spot price) to be about 4.7 million tonnes. Based on the 2004 nuclear electricity generation rate this amount is sufficient for 85 years. Deposits of uranium ore are distributed across a range of countries, including those on whom we are not currently dependent for fossil fuels. Using IAEA figures it is possible to make a rough, high-level estimate that reserves in Australia alone will last another 150 years, with reserves in Canada lasting 45 years, based on current estimated resource and production levels.

The demand for uranium has increased in recent years, resulting in higher prices for uranium ore. However, the IAEA expect future increases to be modest, even with further increasing global demand. Prices are expected to remain substantially below historically high levels of the 1970s. At the same time the increases we have seen are expected to encourage further exploration of uranium resources, as can be seen from the new mines expected to open across the world and from the increasing exploration.

Increases in the price of fuel will have a relatively minor effect on the economics of nuclear power, because fuel costs represent only approximately 11% of the levelised cost. The doubling of uranium prices since 2000 has had only a minor impact on final fuel costs and

overall generation costs. By contrast, gas-fired generation is vulnerable to changes in the cost of fuel because this makes up around 70% of its levelised cost.

Recommendation 14: *At present nuclear power can justifiably be regarded as a low-carbon source of electricity. However, the extent to which this can be sustained needs to be examined. There is some evidence to suggest that the level of emissions associated with nuclear might increase significantly as lower grades of ore are used. Given the concerns expressed by the nuclear industry itself over the adequacy of uranium supplies after 2015, we regard this as a serious issue and one which can hardly be resolved in the time-frame of the current Energy Review. In view of its importance, the Government should consider asking the Royal Commission on Environmental Pollution to report on carbon emissions associated with all generating technologies. (Paragraph 95)*

The Energy Review Report agrees that lower grade ores will require more energy to make fuel for nuclear power stations, which could increase the lifecycle carbon emissions from nuclear power. However, it is not expected that high-grade resources will be depleted in the foreseeable future. This view is endorsed by the International Atomic Energy Agency (IAEA) and NEA; none of the planned new mining projects are of significantly lower grade ores than that currently mined. As such, we can have confidence that the estimates of the lifecycle emissions from nuclear will remain comparable with wind power, a view highlighted by the Sustainable Development Commission.

Recommendation 15: *The risk of a major accident at a nuclear power plant may be remote but the consequences can be huge. This is reflected in the need for governments to underwrite the industry against losses in excess of Euros 700 million. Moreover, the risks of terrorist attacks on nuclear installations and the risks associated with any further proliferation of nuclear power are serious. (Paragraph 103)*

We agree with the Committee that the nuclear industry represents particular hazards. That is why safety and security in the industry is uniquely and robustly regulated. The effectiveness of those arrangements has been demonstrated over many years.

The security regulator, the Office for Civil Nuclear Security, assesses that while the consequences of a successful terrorist attack might indeed be serious, it does not follow that the risk of a terrorist attack on a civil nuclear installation is serious. Measures taken to reduce vulnerability (for example, the deployment of the Civil Nuclear Constabulary that the report refers to) ensure this risk is low by reducing the likelihood of an attack and the possibility of such an attack being successful.

The safety regulator, the Health and Safety Executive's (HSE's) Nuclear Installations Inspectorate, has in place a regime that provides for the application of a high standard of safety aimed both at minimising radiation exposures from normal operations and at preventing major accidental releases of radioactivity at nuclear installations. They require operators to demonstrate the safety of activities at nuclear sites and that they are complying with the strict conditions of their nuclear site license, and other relevant safety legislation. Operators are legally obliged to have detailed emergency plans which would be put into

effect for serious accidents and have reporting arrangements in place for incidents occurring on their sites. The site licence conditions require operators to keep the safety of nuclear sites under constant review. For the UK's nuclear power stations, HSE will only consent to restart operations when it is satisfied that the operator's safety case justifies further operations.

Paragraph 99 of the Committee's report provides only a partial description of the UK's nuclear liability arrangements and the justification for those arrangements. The nuclear industry is uniquely required to provide financial guarantees for damage it may cause to third parties. Unlike other hazardous industries, it is also strictly liable, irrespective of fault. The level of operator liability in the UK is determined by the Paris Convention, which in turn reflects the level of insurance available and is set at a level sufficient to deal with all but the most serious of incidents. In addition to the operator's responsibility, the UK government has a legal obligation to provide additional compensation (up to a current limit of about £240m), and for claims to be made up to 30 years after any incident.

With regard to nuclear proliferation, the UK—along with international partners—is looking at ways to offer access to the benefits of nuclear energy to all, without encouraging the spread of the sensitive fuel cycle technology, such as uranium enrichment, that could be used in a clandestine nuclear weapons programme. The basis for such a mechanism would be to back up the existing commercial market with a multi-national approach administered by the International Atomic Energy Agency to ensure the supply of nuclear fuel to reactors, so that states would not need to develop an indigenous enrichment capability.

Recommendation 16: No country in the world has yet solved the problems of long-term disposal of high-level waste. The current work being conducted by CoRWM will not be sufficient to address the issue of waste associated with new nuclear build. In particular, a further study to identify the likely costs of the latter would be required in order to reduce investment risk. (Paragraph 108)

CoRWM concluded that deep geological disposal in a repository is the best available approach for the long-term management of waste, and that a programme of interim storage (already planned by the NDA as part of its strategy) is required. While CoRWM has no position on the desirability or otherwise of nuclear new build, CoRWM has however said that “in principle” new build wastes could be incorporated within in their options, although this would raise practical issues about the size, number and location of facilities, which would need to be properly assessed. CoRWM's final report was published at the end of July⁷. The Government will respond in a formal statement to Parliament as will the Devolved Administrations, setting out how work to manage long-term waste will be taken forward.

Recommendation 17: Uncertainties in world markets for fossil fuels, in the regulatory framework which will apply, and in the pace of technological development—particularly

⁷ See <http://www.corwm.org.uk/content-1092>

with regard to renewables—make it very difficult to predict the future costs of different forms of generation. It is likely that we will see significant and perhaps unexpected changes in such costs over the next 20 years, and attempts to produce comparative figures in terms of costs per kilowatt hour are therefore of limited value. In such circumstances, absolute differences in generating costs matter less to investors than long-term certainty with regard to costs and income; while if market and regulatory frameworks cannot provide such certainty, investors will inevitably focus on short-term rewards. (Paragraph 116)

Government agrees that certainty is a key driver of investor behaviour. Fossil fuel prices are just one, though important, element in understanding the potential future costs of different generating technologies. Predictions over a 20 year timeframe are indeed difficult. In reaching the cost estimates for different forms of generation the Energy Review used a range of assumptions on factors such as fossil fuel prices, capital costs, plant lifetimes and discount rates.

Given the uncertainty about technology costs the Government's role is not to try to pick winners but to seek to create long-term certainty in market and carbon frameworks in order to encourage investments which meet the goals of energy policy. The Government is therefore committed to taking forward the EU Emissions Trading Scheme in a way which will create the right conditions for long-term investment in electricity generation. In particular, we believe that we need to signal the direction of EU emissions reductions much further into the future, as well as simplifying and harmonising the scheme more generally.

The Government has made a long-term commitment to put the UK on a path to a 60% reduction in carbon emissions by 2050. But it is not for the Government to determine how this reduction will be achieved. Energy investment decisions in the UK are taken by the private sector within a market-based energy policy framework. Against this background we have identified, in the Energy Review, ways in which government can improve the investment environment.

Reducing policy uncertainty

Given the long-term nature of investments in electricity generation, policy uncertainty may create a barrier to new investment. Policy uncertainty affects the economics of all new power stations, by raising the cost of the capital companies need to borrow to make new investments. It can disproportionately affect technologies that require higher levels of upfront capital investment, such as low carbon technologies. Submissions to the Energy Review consultation particularly emphasised the need for clarity on the Government's future policy direction on renewables and on nuclear.

We have therefore:

- Confirmed and strengthened our commitment to the Renewables Obligation; and
- Clarified our position on new nuclear build.

Reducing regulatory uncertainty

Another area of concern highlighted during the Energy Review consultation was the need to improve the planning process for all energy infrastructure. Uncertainties and delays caused by the existing planning process increase the likelihood that investments in new power stations (and other energy infrastructure such as gas storage) will not be timely. Proposals to improve the planning process for large-scale electricity generation are set out in a separate planning chapter. The proposed improvements should help in two ways:

- They should provide more certainty as to the timescales for any given planning inquiry; and
- They should shorten the overall timescales from application to a final decision on consent.

These proposals should help to incentivise investments in all forms of electricity generation, including low carbon technologies.

Sending a strong signal about the value of low carbon investment

The UK remains committed to a carbon price signal; a credible and continuing carbon price is crucial for sending a strong signal to companies about the need for low carbon generation. The EU ETS is here to stay beyond 2012 and will remain the key mechanism for providing this signal, and Government will continue to work with our international partners to strengthen the Scheme to make it more effective. We will keep open the option of further measures to reinforce the operation of the EU ETS in the UK if this should be necessary to provide greater certainty to investors.

Improving the quality of forward looking market information

Companies will need to buy their electricity over the next 10-15 years against a background of many uncertainties in the electricity market. Companies wishing to invest in new power stations will face these same uncertainties.

To mention just a few of these:

- it is likely that the long term average prices of fossil fuels will be higher in the UK than over the previous decade but neither companies nor Government can know how future prices might evolve. The future price of fossil fuels will affect the price of the electricity we buy;
- the exact pattern and timing of closures of coal and nuclear power stations is uncertain and as mentioned, the pattern of closure and new investment will affect electricity prices; and
- given the multilateral nature of the EU ETS, neither Government nor companies can be sure of the pace at which this scheme will evolve.

Against this background of uncertainties, Government believes there is a strong case for improving the quality and dissemination of forward looking market information for companies and investors. There was strong support for improved information in the submissions to the Energy Review Consultation.

Government will introduce new arrangements for the provision of forward-looking energy market information and analysis relating to security of supply. Led from the DTI and working with key energy market players, the objective will be to bring in one place relevant data and analysis on the medium and long term adequacy of future energy supplies to help early identification of areas where policy may need to be reviewed and to assist energy market participants with their investment and purchasing decisions.

Recommendation 18: No simple answer can be given to the question of the likely cost of nuclear power. The cost will vary depending on the degree of risk which investors perceive is involved. This in turn will depend on a complex web of factors including the nature of the market, and the regulatory and policy framework which is in place. In this respect, there can be radical differences between countries, as the contrast between Finland and the UK demonstrates. (Paragraph 118)

The Government agrees that there is no simple answer to the question of the likely cost of nuclear power. The Energy Review produced a detailed cost benefit analysis of nuclear power and produced a range of generation cost estimates for new build plant in the UK. It is likely, but not certain, that the actual cost of nuclear new build in the UK will fall within the range considered in the cost benefit analysis.

The cost benefit analysis did not attempt to weight alternative cost scenarios; it will be for the private sector to do this, given that any new nuclear build in the UK would be initiated, funded, constructed and operated by the private sector. Energy investment decisions in the UK are taken by the private sector within a market-based energy policy framework. They account for a range of specific factors, including for example post construction financing costs and market conditions, which are not included in the cost benefit analysis.

The cost benefit analysis for nuclear power generation assessed the following:

- The full cost of new nuclear generation, including pre development, construction, operation and maintenance, fuel, waste management and plant decommissioning;
- The benefits of new nuclear generation with regard to carbon emissions reduction and security of energy supply.

The nuclear cost figure was based on various studies together with industry feedback, and construction cost data from the new nuclear plant currently under construction in Finland. A premium was added to the Finnish project for the central case cost estimate to allow for various possibilities (e.g. higher costs associated with regulation, project delays, labour, etc.). The assumption on the appropriate cost of capital to use was based on common industry usage. Waste management costs were estimated on the assumption that future

waste would be disposed of together with legacy waste in a deep underground repository based on the Committee on Radioactive Waste Management's estimates of costs published last year. The underlying assumption on decommissioning costs used was based on the high side of industry expectations.

Recommendation 19: *Any new investment in generating capacity outside the framework of the Renewable Obligation will almost certainly be in gas, and we will inevitably be dependent on new CCGT plants for most of the 15GW to 20GW of new generating plant we will need by 2016. However, while there may be a certain degree of scaremongering on the part of the industry, it is by no means certain that the current highly liberalised UK electricity market will in fact provide timely investment in new generating capacity and ensure security of supply. Given the central importance of this issue, we find it strange that it is not included in the issues on which the Government is seeking views as part of the current Energy Review. The Government must therefore consider as part of that review whether there is a need to amend the current UK electricity trading arrangements in order to provide some form of capacity incentive and promote longer-term investment perspectives. (Paragraph 123)*

The Review did consider energy infrastructure investment requirements as a key issue and looked at what can be done to improve the market framework to ensure that those investments are made in good time. The incentives for companies to build new power stations need to be consistent with the economy's need for capacity to be added in a timely way. We shall continue to monitor the investment outlook very closely.

The Review looked at mechanisms to bring forward investments for electricity generation and commissioned a study by consultants (Redpoint Energy) to analyse the need for government intervention. Conclusions of the study have been published on the review website and the 'Energy Challenge' document includes a section on investment in new capacity and the case for government intervention.

The Review concluded that the case for government intervention has not been made. The modelling showed that any intervention—such as a capacity mechanism – would impose significant costs and some risks on the system and, ultimately, the final consumer. The modelling indicates that while the policy options analysed can be effective in trying to address the issues identified around capacity shortfall, they can have unintended and often undesirable side-effects, such as further volatility in prices or higher carbon dioxide emissions. Such side-effects have indeed been one of the issues identified in markets elsewhere that have implemented capacity type mechanisms. We anticipate that, through the enhanced information provision arrangements for security of supply, the Government will be in a position to monitor the development of this market effectively to ensure that the framework continues to deliver. In addition, the proposals we made in the Review to clarify the policy position on renewables and nuclear, the commitment to a long term carbon market and to improve the planning regime should remove uncertainty for investors and make it easier for companies to respond with new investment in a timely manner.

The Redpoint report is at <http://www.dti.gov.uk/files/file31799.pdf>.

Recommendation 20: *It is sometimes argued that a greater reliance on gas, as envisaged in the Energy White Paper, would result in an increase in carbon emissions from the power generation sector as a whole. However, this is not necessarily true as substantial further carbon reductions of up to 40% could be achieved simply by replacing inefficient coal plant with new CCGT. (Paragraph 129)*

There is widespread agreement that technically, substantial reductions in CO₂ emissions can be achieved as a result of switching from coal to gas. There is a significant potential emission saving available by switching generation from coal to existing gas plants. The further step of switching generation from the least efficient coal stations to new CCGT plants is not conventionally considered to be amongst the most cost—effective options for the generation sector. The economic attractiveness of this and other options will depend, amongst other factors, on relative gas and coal prices and incentives brought about by the operation of the EU-ETS. There is no indication that the current juxtaposition of fuel prices and the price of carbon is likely to lead to early closure of coal plants and replacement with new CCGTs. It is however anticipated that there will be some closure of coal - fired capacity in the longer term, driven by a range of factors, including the requirements of the Large Combustion Plant Directive. DTI energy projections already reflect this trend.

It should be borne in mind that the market segments in which inefficient coal plants and new CCGTs operate could be very different and that in reality, overall system efficiency would change by less than might otherwise be imagined. This would tend to reduce the achievable emission savings.

Recommendation 21: *Current policy instruments for low-carbon generation are failing to provide a secure long-term funding framework which will offer sufficient confidence to investors. As a result, progress in certain critical areas such as offshore wind and carbon capture and storage is in danger of stalling. The Government must increase the amount of capital funding available for key low-carbon technologies. It should also consider as part of the Energy Review the possibility of either banding the Renewables Obligation to offer a variety of incentives for different technologies or else introducing guaranteed contracts for tranches of low-carbon generation. (Paragraph 141)*

The Government has already made available, up to 2008, around £500m of spending in the form of capital grants and R&D for emerging renewable and low carbon technologies.

The Energy Review announced a number of proposals for changes to the RO intended to provide more support for emerging technologies. These are banding the RO; extending the RO to 20% on a guaranteed headroom basis; freezing the buyout price in 2015/16; and the introduction of a mechanism to allow the tapering down of ROC prices once generation exceeds the level of the Obligation. The Government will consult on these proposals in autumn 2006.

The Energy Review also considered the potential of Carbon Capture and Storage technologies and concluded that the next stage for these would be a full-scale

demonstration provided this proved cost-effective. More work is needed on the costs of a demonstration and an announcement will be made at the Pre-Budget Report in the autumn.

We should like to add a small clarification to the text of the Committee's Report at paragraph 136, where it quotes from the minute of the November 2005 meeting of the Sustainable Energy Policy Advisory Board (SEPAB). Despite the implication in the paragraph that the proposal quoted had been put forward by SEPAB, in fact the minutes simply report views expressed by members of the Board during their meetings. The points and views expressed in the minutes are those of the individual members but they do not necessarily constitute an agreed position by the whole Board. Members are appointed in their capacity as independent expert advisers and there is no requirement that the Board should adopt agreed positions in its discussions.

Recommendation 22: The Government has stated that it will not provide any form of direct or indirect financial support for a new generation of nuclear power stations. We welcome this. Nuclear is an established technology which, like coal and gas, has benefited in the past from very large financial subsidies. In this respect, it contrasts strikingly with emerging renewables such as offshore wind and marine, where financial support is initially required to bring them to market and generate the cost-reductions which will enable them over time to compete with other forms of generation. (Paragraph 148)

The Energy Review Report makes clear that any new nuclear power stations would be proposed, developed, constructed and operated by the private sector, who would also meet full decommissioning costs and their full share of long-term waste management costs.

Recommendation 23. Governments should make clear to consumers and taxpayers that low-carbon technologies have an explicit price premium: we cannot move to low-carbon power generation on the basis of cheap energy. (Paragraph 154)

The Government accepts that moving to a low carbon economy in the long term will not be costless. But analysis, by among others the Intergovernmental panel on Climate Change, indicates that the long term costs of achieving a 60% reduction in carbon emissions by 2050, which that Government has accepted as a goal, can be achieved at a cost to GDP of less than 2%. GDP is in any case likely to be up to three times larger by this date as a result of economic growth.

The Government has also made clear that policies such as the Renewables Obligation and the EU ETS will have an upward impact on electricity prices. Analysis on the costs of these policies and their benefits in the form of reduced carbon emissions is published in the form of Regulatory Impact Assessments as the policies are introduced.

The Energy Review recognized that carbon abatement can be costly and can increase energy prices. Acting internationally is the best way to minimise these impacts. The existence of the EU ETS is having an impact on electricity prices in the UK, and elsewhere, because electricity generators will factor in the cost of carbon allowances.

We have taken cost effectiveness into account in developing policies to reduce carbon and improve security of supply, and have examined how to reduce barriers to current policies to deliver greater carbon savings at little or no extra cost. We therefore expect the impact on energy bills to be small. We will undertake a full analysis of the impact of our proposals in the forthcoming White Paper.

A £12 million climate change communications initiative was launched on 1st December 2005. The three-year campaign ‘Tomorrow’s Climate, Today’s Challenge’ aims to raise awareness about the threat of climate change and the role individuals can have in making a difference. It comprises a package of communications materials that highlight the need for collective action to tackle the problems which climate change poses and includes a £6 million fund for the next two financial years to support local projects in England. So far, more than 280 organisations have registered their interest in the fund. Details can be found on www.climatechallenge.gov.uk

Recommendation 24. *It is notable that the July 2005 monitoring report from the Sustainable Energy Policy Network gave no indication whatsoever of the need for a wide ranging energy review, other than a cursory reference to the Prime Minister’s statement that a decision on nuclear needed to be made during this Parliament. This must show either that the Sustainable Energy Policy Network monitoring process is itself flawed, or that there is in fact no need at this stage for a review; and we are therefore concerned that the Review does not appear to have resulted from a due process of monitoring and accountability. (Paragraph 161)*

Energy White Paper acknowledged that it could not set out detailed plans for the long term: “We need to be prepared, within a firm and clear strategic context, to review the impact of policy changes and to update and amend our detailed policy measures in the light of experience.” The Energy Review has considered, within the clear framework of the four goals of energy policy established by the White Paper, the need for further measures to meet our long-term goals.

The scope of the Annual Report on the implementation of the Energy White Paper is set by statute in the Sustainable Energy Act 2003. This determines that the report be largely retrospective in focus, reporting on the previous year’s activities. In 2005 the Annual Report was published on 21 July but the Prime Minister did not formally announce an Energy Review until 29 November. Despite this, the Annual Report did cover the changing circumstances that would later lead to the announcement of the Review, including: the growing challenge of addressing climate change; heightened concerns about energy security in the long-term; and rising energy prices.

Recommendation 25: *Since the Energy White Paper, we would agree that various changes justify the need for a thorough review of implementation. However, the nature of the Energy Review itself is unclear and the case for a wider ranging review of energy policy has not been made. It will fail to command the support of stakeholders, the public and politicians if what emerges is significantly different from the course that was charted in the Energy White Paper without a proper explanation of how circumstances have*

altered sufficiently to justify such a change and without further wide-ranging consultation on the nature of the change. (Paragraph 163)

The Energy Review maintains a clear commitment to the energy policy goals set out in the 2003 Energy White Paper.

The Energy White Paper did not seek to define every detail of the policies we will need over the next two decades—it was always envisaged that policy would be further developed and refined following the direction of travel set by the 2003 EWP.

The Review was set up to consider what measures may be needed to help us meet our Energy White Paper goals in the context of strengthening climate change evidence, rising fossil fuel prices and increasing import dependencies.

The evidence to support these views is set out in the Review report. The report also sets out a programme of consultation and further policy development in key areas including:

- Revised policy framework for nuclear power generation;
- Changes to the Renewables Obligation to provide more support for further from market technologies;
- Proposals for a mandatory emissions trading scheme, alongside other options for achieving our carbon reduction aims in the large non-energy intensive sector.

Recommendation 26: *A key theme underpinning the review is the Government's argument that a decision on energy, and specifically nuclear generation, has to be made: 'doing nothing is not an option'. But, in the context of the Government's confidence in liberalised markets, we are at a loss as to what the nature of such a decision could amount to, and the Secretary of State was himself unable to clarify matters. (Paragraph 165)*

The Committee questioned the nature of Government decisions on energy policy within a liberalised market framework. The decisions that Government has taken—and will need to take as we develop the policy proposals set out in the Review—are designed to work within that framework.

Actions in the Review include:

- Providing increased policy certainty by identifying Government's priorities for strengthening the future shape and form of the EU ETS;
- Providing better information to consumers through requiring electricity and gas suppliers to include historic information on bills;
- Signalling announcements on the Code for Sustainable Homes and the future tightening of Building Regulations;
- Stimulating micro-generation through proposals to ease planning constraints and the £50m support programme announced in the Budget;

- Promoting new technologies, for example, by improving the existing support regime for renewable generation and inviting bids for pre-commercial carbon abatement technology;
- Revising the policy framework for nuclear power; and
- Improving the planning framework for large-scale energy infrastructure.

In all these cases the impact on the 2003 Energy White Paper goals will be delivered through the actions of individuals, businesses and the energy industry as well as Government.

Recommendation 27: The Energy Review is only one of a number of important reviews currently being undertaken. It is extremely unsatisfactory, for example, that it has been launched before the publication of the long-delayed Climate Change Programme review. Moreover, the Stern Review of Climate Change is not due to report until the Autumn—after the Energy Review has itself reported—even though logically it should come first. This does not inspire confidence about the extent of coordination within and between different parts of Government. (Paragraph 168)

A new UK Climate Change Programme was published in March 2006, following the Government's Climate Change Programme Review. The new Programme sets out our policies and priorities for action in the UK and internationally to tackle global climate change. Specifically, the Programme focuses on measures to put the UK on track to meet its 2010 carbon emissions target (as set out in the Government's Energy White Paper 2003), with some consideration of measures to 2020.

The findings of the Government's Energy Review were published in July 2006 and focus on policy measures to help us deliver our energy policy objectives beyond 2010. The Review looks to ensure the UK is on track to meet the goals of the 2003 Energy White Paper in the medium and long term.

The Stern Review of the Economics of Climate Change—which will report to the Prime Minister and Chancellor in autumn this year—aims to contribute to a sound understanding of the global economic implications of climate change by setting out how climate change could impact on growth and development, identifying the costs and opportunities from tackling it, and exploring elements of a robust international response.

The overlapping nature of these three separate, but interrelated, reviews has involved a well-coordinated and joined-up effort on behalf of different parts of Government. This has been successfully achieved through processes involving a high level of cross-departmental involvement and engagement on a number of issues. For example, the policy measures outlined in the new Climate Change Programme have been taken into account in the analysis for the Energy Review in looking at the progress the UK is likely to make towards its carbon goals. Further, elements of the analytical process adopted for the Climate Change Programme Review (such as the approach taken for appraising policy proposals and undertaking cost benefit analyses) is consistent with the approach used during the Energy Review. In addition, the Energy Review team and the Stern Review team have

worked closely together over the past 6 months, sharing analysis on climate change issues including the future shape and form of the EU Emissions Trading Scheme, an initial assessment of carbon budgeting, and broad analysis of competitiveness issues with respect to different policy interventions.

Such co-ordination has ensured that Government has analysed the various short, medium and long-term climate change and energy policy issues in a coherent and consistent manner to make sure that our policy response is the most appropriate way to address the challenges we face.

Report Conclusions (cross-referenced to responses to recommendations)

Recommendation 28: *By 2016, it is likely that between 15 and 20GW of electricity generating plant will be decommissioned. This amounts to nearly a quarter of total UK generating capacity. Over the next 9 years, therefore, very substantial investment in new generating capacity and energy efficiency will be required if the lights are to stay on—even in the absence of demand growth. Further substantial investment on a comparable scale may be required in the following decade. (Paragraph 169)*

See response to Recommendation 1.

Recommendation 29: *At the same time, the UK is facing the unprecedented challenge of achieving radical reductions in carbon emissions in an effort to combat global warming—as reflected in the difficulty of achieving the UK 2010 carbon reduction target. The electricity generating sector accounts for nearly a third of total emissions and it will therefore need to play a significant role in achieving such reductions, and indeed the achievement of the 2050 target will depend heavily on the nature of investment in generating capacity over the next two decades. The Energy White Paper of 2003 addressed the need for carbon reductions across the economy but did not set specific targets for the generating sector. However, it endorsed the view set out in the Performance and Innovation Unit (PIU) report that new gas-fired plant, renewables and energy efficiency could make up for the potential generating gap. (Paragraph 170)*

See response to recommendation 2.

Recommendation 30: *Over the next ten years, nuclear power cannot contribute either to the need for more generating capacity or to carbon reductions as it simply could not be built in time. The potential generating gap during this period will need to be filled—largely by an extensive programme of new gas-fired power stations, supplemented by a significant growth in renewables. Contrary to popular belief, a further 'dash for gas' would result in significant carbon savings. Moreover, it is not clear how much effect the replacement of older coal and nuclear plant by gas will have on the security of total electricity supplies, as we will in any case become highly dependent on foreign imports of fossil fuels for our total energy requirements (Paragraph 171)*

We have acknowledged (see responses to recommendations 12 and 20) the Committee's statements about the time period for building new nuclear power stations and about the carbon savings offered by switching from coal to gas generation.

To ensure secure energy supplies, we will aim to maximise our own oil and gas reserves by boosting the attractiveness of investment in the UK compared to other regions of the world. This will help recovery from fields that are already producing and establish infrastructure to the west of Shetland for our undeveloped heavy oil resources. HM Treasury's discussions with industry on the wider structural issues of the oil and gas fiscal framework will also be important.

We will ensure diverse sources of supply and reduce our gas dependence through energy efficiency, and improving the investment environment for distributed generation, renewables and nuclear generation. We will keep up international pressure to liberalise markets in the EU. We will manage the risks of increased reliance on gas imports by encouraging timely investment in storage and import infrastructure. We will work with industry to provide better market information and analysis to business and investors. And we will consult in the autumn with both industry and energy users on the effectiveness of current gas security of supply arrangements.

See also responses to recommendations 1, 17 and 19.

Recommendation 31. By 2016 at the latest, substantial further investment in generating capacity will be needed, and there are a number of different lower-carbon technologies which could contribute on a large scale—including renewables, microgeneration, offshore wind, nuclear, and carbon capture and storage. But there is substantial evidence to show that progress in deploying key technologies—in particular carbon capture and storage, off-shore wind, and microgeneration—is inadequate. The real issue which the Government is failing to address is whether the policy and regulatory framework in place is sufficient to stimulate the growth of lower-carbon generation on the scale required. (Paragraph 172)

We will encourage all low carbon technologies by making a continuing strong long-term commitment to carbon pricing. We will boost renewable energy by strengthening the Renewables Obligation (RO), tackling barriers such as planning, and consulting on changes to the RO that would aim to bring on renewable technologies that are further from the market. We will also take steps to exploit the potential for 'distributed generation' which would enable us to generate energy efficiently near to where we use it. We will remove regulatory barriers to and reduce uncertainty for new nuclear investment. We will make further progress in laying the groundwork for the possible adoption of carbon capture and storage in the UK and elsewhere. We will bring forward a transport innovation strategy to help develop alternative fuels and technologies.

The Government has applied targeted support to assist deployment of key technologies such as microgeneration, offshore wind and carbon capture and storage. Our responses to recommendations 7, 8, 9, 17 and 21 provide more details.

Recommendation 32: *All lower-carbon generating technologies are more expensive than coal and gas, and will require a long-term funding framework in order to reduce investment risk and ensure that the necessary investment takes place. The current highly liberalised UK electricity market structure is too short term and fails to provide such a framework. Indeed, it is not clear whether it will even ensure that enough investment takes place to keep the lights on by 2016. There are a number of options open to the Government to address this—including the introduction of some form of capacity payment, the development of low-carbon generation contracts, and the modification of the Renewables Obligation to provide a range of incentives for different technologies. The Government will need to consider what changes to the market structure are required as part of the Energy Review. (Paragraph 173)*

The review did consider energy infrastructure investment requirements as a key issue and looked at what can be done to improve the market framework to ensure that those investments are made in good time. The incentives for companies to build new power stations need to be consistent with the economy's need for capacity to be added in a timely way. We shall continue to monitor the investment outlook very closely.

The Review looked at mechanisms to bring forward investments for electricity generation and commissioned a study by consultants (Redpoint Energy) to analyse the need for government intervention. Conclusions of the study have been published on the review website and the 'Energy Challenge' document includes a section on investment in new capacity and the case for government intervention.

Given the uncertainty about technology costs the Government's role is not to try to pick winners but to seek to create long-term certainty in market and carbon frameworks in order to encourage investments which meet the goals of energy policy. The Government is therefore committed to taking forward the EU Emissions Trading Scheme in a way which will create the right conditions for long-term investment in electricity generation. In particular, we believe that we need to signal the direction of EU emissions reductions much further into the future, as well as simplifying and harmonising the scheme more generally.

The Government is committed to the development of renewable generation post 2010 and as part of the Energy Review announced a number of proposals for changes to the RO intended to provide more support for emerging technologies. These are banding the RO; extending the RO to 20% on a guaranteed headroom basis; freezing the buyout price in 2015/16; and the introduction of a mechanism to allow the tapering down of ROC prices once generation exceeds the level of the Obligation.

The Government has made a long-term commitment to put the UK on a path to a 60% reduction in carbon emissions by 2050. But it is not for the Government to determine how this reduction will be achieved. Energy investment decisions in the UK are taken by the private sector within a market-based energy policy framework.

See also responses to recommendations 7, 19 and 21.

Recommendation 33: *Nuclear power raises a variety of issues which would need to be satisfactorily resolved before any decision to go ahead is taken. These include long-term*

waste disposal, public acceptability, the availability of uranium, and the carbon emissions associated with nuclear. There are also serious concerns relating to safety, the threat of terrorism, and the proliferation of nuclear power across the world. Moreover, given the fact that substantial changes in the relative cost of energy technologies are likely to occur over the next 20 to 30 years, it is by no means clear whether investors will wish to commit themselves to 70 years of nuclear generation. There are striking similarities here to the position in 1980 when a similar large scale programme of nuclear new build eventually resulted in the construction of only one new reactor Sizewell B. (Paragraph 174)

In the Energy Review, the Government set out its view that nuclear has a role to play in the future UK generating mix alongside other low carbon generating options.

Nuclear power is a source of low carbon generation which contributes to the diversity of our energy supplies. Under likely scenarios for gas and carbon prices, new nuclear power stations would yield economic benefits in terms of carbon reduction and security of supply. For example, by 2030, if retiring nuclear capacity had been replaced by new nuclear stations rather than gas, our carbon emissions would be 9 million tonnes lower and our gas consumption 13% lower.

Any new nuclear power stations would be proposed, developed, constructed and operated by the private sector, who would meet full decommissioning and their full share of long term waste management costs.

But in view of the potential benefits, Government proposes to address barriers to nuclear new build by: improving the process for licensing new reactors, and also the planning process (which can delay large electricity projects generally, not just nuclear); and by clarifying how the costs of decommissioning reactors and managing waste will be paid for.

All the nuclear-related issues listed by the Committee are indeed factors in both public and private sector consideration of proposals for building new nuclear power stations. Our responses to recommendations 11, 12, 13, 14, 15, 16 and 18 cover these points in more detail.

Recommendation 34: *A Government decision to support a major programme of nuclear new build must also take account of the impacts on investment in other areas—notably energy efficiency, renewables, carbon capture and storage, and the development of distributed generation systems. The potential of these various technologies over the next 20 to 30 years is immense, and any public subsidies for nuclear must be weighed against the substantial progress towards reducing carbon emissions and ensuring a greater degree of security of supply which these alternatives could achieve with similar subsidies. However, as all forms of lower-carbon generation will require financial support, the Government should accept that the shift to a sustainable energy strategy cannot be based - at least in the medium term—on maintaining low energy prices. (Paragraph 175)*

The Energy Review stated clearly that any new nuclear power stations would be proposed, developed, constructed and operated by the private sector, who would meet full decommissioning and their full share of long term waste management costs.

The Government's approach cannot be based on picking winners but instead to create long-term certainty in market and carbon frameworks to encourage investment. The UK remains committed to a carbon price signal; a credible and continuing carbon price is crucial for sending a strong signal to companies about the need for low carbon generation. The EU ETS is here to stay beyond 2012 and will remain the key mechanism for providing this signal, and Government will continue to work with our international partners to strengthen the Scheme to make it more effective. We will keep open the option of further measures to reinforce the operation of the EU ETS in the UK if this should be necessary to provide greater certainty to investors.

See also responses to recommendations 17, 22 and 23.

Recommendation 35: *The Government should be doing far more to promote progress in these other areas. Carbon capture and storage will, in particular, be of crucial importance in view of forecasts which show increasing use over the next thirty years of fossil fuels—especially in developing countries such as China and India. Renewables and distributed generation could also contribute hugely in both a national and global context—but any of the technologies involved warrant special support to bring them to market and achieve the cost-reductions which will make them competitive. (Paragraph 176)*

The Energy Review has set out a range of proposals to reinforce existing action in these areas. These include:

- working to develop a credible international carbon framework with particular focus on how to build on the Kyoto Protocol after 2012;
- working with the European Commission on proposals for the third phase of the European Union Emissions Trading Scheme to ensure it creates clear incentives for early investment in low carbon technologies, and continues to drive reductions in carbon emissions at least cost;
- removing regulatory barriers to Carbon Capture and Storage (CCS), intensify cooperation with international partners such as Norway on shared challenges relating to CCS, and undertaking further work on the costs of CCS demonstration with a further statement in the PBR;
- strengthening demand for low carbon alternatives such as biomass, solar and heat pumps by encouraging homeowners, builders and local authorities to invest in low-carbon solutions;
- removing the obstacles to emerging technologies by implementing the Microgeneration Strategy and removing planning barriers;
- consulting on possible changes to the Renewables Obligation aimed at making it more effective at bringing on renewable technologies;
- taking further action to address concerns around renewables by streamlining planning process for large scale renewable projects and encouraging greater co-firing of biomass with coal fired power stations; and

- a comprehensive series of measures to bring on more ‘distributed generation’ in the long term. We are announcing two reviews to identify the long-term potential of distributed energy in the UK and on how to remove barriers to delivering its potential.

See also responses to recommendations 7, 8, 9, 10 and 21.

Recommendation 36: *While this inquiry has focussed primarily on supply side issues, we cannot emphasise enough that reducing demand is also a vital component on the path to a sustainable energy strategy. There is, as yet, little evidence to suggest that the Government has succeeded in doubling the rate of energy efficiency improvements as envisaged in the Energy White Paper. Far more decisive action and political leadership is required, and we would also urge the Government to consider setting absolute targets for reductions in demand as a way of stimulating the growth of energy efficiency and guaranteeing the level of carbon savings achieved. (Paragraph 177)*

All sectors of the economy are expected to play their role in the UK’s efforts to meet both our domestic and international targets for reducing carbon emissions.

Saving energy is key to meeting our long-term energy challenges. The 2003 Energy White Paper, the 2004 Energy Efficiency Action Plan and most recently the Energy Review place energy efficiency at the heart of our energy policy. Energy efficiency policies will deliver almost half of the carbon savings set out in our 2006 Climate Change Programme to 2010. We also believe energy efficiency can contribute at least a third of the additional carbon savings we need by 2020 and beyond. The new energy efficiency policies signalled in the recent Energy Review reinforce how integral energy efficiency is to our long-term energy vision.

We acknowledge that, counter to our objective, absolute demand for energy continues to rise at about 1.5% per annum due to changing social trends and greater wealth, amongst other things. However, it must be emphasized that it is only comparatively recently, under the UN Climate Change Convention and the Kyoto Protocol, that we have systematically worked to deliver improvements in energy efficiency as a means of delivering carbon savings and there is an inevitable delay before the full impact of policies can be seen and measured. We would not yet expect to see a doubling in the rate of energy efficiency - this is a 2010 target - but we are far from complacent.

The Government is committed to driving up energy efficiency across all sectors. We are aware of the considerable issues that still require attention given the scale of the challenge and we are committed to seeking to drive things forward effectively and constructively, putting energy efficiency firmly at the heart of energy policy to 2020 and beyond.

See responses to recommendations 2, 3, 5 and 6.

37. The nature of the current Energy Review is unclear—whether it is specifically fulfilling the Prime Minister's desire to make a decision on nuclear, whether it is a review of electricity generating policy, whether it is a wider review of progress against the Energy White Paper, or whether it is reopening the broad policy debate which the White Paper itself encompassed. We are also concerned that it does not appear to have resulted from a due process of monitoring and accountability, and that the process by which it is being conducted appears far less structured and transparent than the process by which the White Paper itself was reached. (Paragraph 178)

The remit of the Energy Review was to examine the UK's progress against the medium and long-term 2003 Energy White Paper goals and consider options for further steps to achieve them. Since we set our energy policy framework in 2003 several factors have made the challenges even more acute:

- Growing evidence of the urgent need to tackle climate change;
- Rising prices for fossil fuels rise across the world;
- The UK increasingly importing more and more oil and gas from a variety of countries; and
- The likelihood that we will need to replace power stations equivalent to almost a third of our existing capacity in the next two decades.

The Review's conclusions are a large, ambitious, evidence-based package of measures proposing further action on both the energy supply and demand side. The wide-ranging nature of the conclusions reflects the scale and complexity of the challenges. From the outset this has not been about finding one single answer to all the difficult issues we face. We need action on many fronts.

The conclusions are based on extensive consultation. We received well over 5000 written responses. During the consultation, the Minister met with over 500 stakeholders to hear their views on Energy Review issues through a programme of stakeholder seminars, round tables and other activities. Many stakeholders organised their own events to discuss the consultation. In total Ministers and the review team carried out over 300 consultation activities during the 12 week period and distributed over 3000 copies of the consultation document.

See also our responses to recommendations 24 and 25.

Recommendation 38: *If the Energy Review is focussed mainly on electricity generation and, in particular, a decision on nuclear, then it is unclear what the nature of such a decision could be and the Secretary of State himself was unable to explain this. Indeed, the Government has always argued that its role is not to prescribe the fuel mix, and it has invested much effort in developing a fully liberalised market which will determine for itself such investment decisions. The frequent statements that it must make a decision on energy, and specifically on nuclear, fundamentally conflict with such an approach and would therefore represent a major U-turn in energy policy. Moreover, if the Government*

does indeed come to a decision on nuclear, it is unclear why it should not also come to a decision on off-shore wind, marine, or micro-CHP—let alone the array of possible measures to support energy efficiency. Yet we never hear Government ministers talking in such terms. (Paragraph 179)

See response to recommendation 26.

Recommendation 39: If, on the other hand, the Energy Review is a wider ranging review of policy it will fail to command the support of stakeholders, the public and politicians if what emerges is significantly different from the course that was charted in the Energy White Paper without a proper explanation of how circumstances have altered sufficiently to justify such a change and without further wide-ranging consultation on the nature of the change. It is also unsatisfactory that it was launched before the publication of the long-delayed Climate Change Programme Review and will be concluded before the Stern Review has reported. This does not inspire confidence about the extent of coordination within and between different parts of Government. (Paragraph 180)

The Energy White Paper published in February 2003 set out the overarching long-term framework for energy policy, based on four goals:

- To put ourselves on a path to cut the UK's carbon dioxide emissions by some 60% by about 2050, with real progress by 2020;
- To maintain the reliability of energy supplies;
- To promote competitive markets in the UK and beyond, helping to raise the rate of sustainable economic growth and to improve our productivity; and
- To ensure that every home is adequately and affordably heated.

While there has been good progress against all the goals since the White Paper was published, we believe that we need to do more to ensure we remain on track to meet these energy policy goals because of a number of changes that have occurred since 2003. These include:

- Evidence about the adverse impact of climate change has continued to grow, requiring international action to address it;
- Fossil fuel prices have risen sharply, and projected prices are now much higher than at the time of the White Paper;
- UK Continental Shelf (UKCS) production of gas and oil has declined more quickly than many projected, and as a result the UK has become a net gas importer again sooner than expected. We are also becoming a net oil importer;
- Progress in introducing truly open energy markets in the EU has been slow over the last three years;

- There has been a general heightening of sensitivity around global energy issues, affecting perceptions of the security of supply from major exporter countries and contributing to higher prices;
- In response to global challenges in energy markets, a number of international fora have initiated work to coordinate action. This includes producer/ consumer dialogues through the International Energy Forum and the EU/OPEC Energy Dialogue; and ideas for reform such as the G7 Finance Ministers' work on improving the functioning of oil markets; and the follow up to the Hampton Court Summit.

It was to address these challenges that the Prime Minister launched the Energy Review in November 2005. The Review has set out a large, ambitious evidence-based package of measures for further action on both energy supply and demand. It also announced further work on a series of long-term proposals and launched a number of consultations to develop policy further in some areas.

The overlapping nature of the Climate Change Programme Review, the Energy Review and the Stern Review has involved a well-coordinated and joined-up effort on behalf of different parts of Government. This has been successfully achieved through processes involving a high level of cross-departmental involvement and engagement on a number of issues. For example, the policy measures outlined in the new Climate Change Programme have been taken into account in the analysis for the Energy Review in looking at the progress the UK is likely to make towards its carbon goals. Further, elements of the analytical process adopted for the Climate Change Programme Review (such as the approach taken for appraising policy proposals and undertaking cost benefit analyses) is consistent with the approach used during the Energy Review. In addition, the Energy Review team and the Stern Review team have worked closely together over the past 6 months, sharing analysis on climate change issues including the future shape and form of the EU Emissions Trading Scheme, an initial assessment of carbon budgeting, and broad analysis of competitiveness issues with respect to different policy interventions.

Such co-ordination has ensured that Government has analysed the various short, medium and long-term climate change and energy policy issues in a coherent and consistent manner to make sure that our policy response is the most appropriate way to address the challenges we face.

See also our responses to recommendations 25 and 27.

Recommendation 40: *We remain convinced that the vision contained in the White Paper—with its focus on energy efficiency and renewables as cornerstones of a future sustainable energy policy—remains correct. What is now needed is a far greater degree of commitment from the Government in implementing it. Alongside, more attention needs to be given to technologies such as clean coal and carbon capture and storage, both of which may have a significant role to play nationally and globally. (Paragraph 181)*

We welcome the Committee's acknowledgement that our focus on energy efficiency and renewables is correct and hope that Energy Review and the subsequent follow-up work that

it has instituted will demonstrate our continuing commitment to sustainable and secure energy supplies.

If all Energy Review proposals were implemented, we estimate that this could lead to carbon emissions being 19-25 million tonnes lower in 2020.

The measures to encourage growth in the renewables industry could produce carbon dioxide savings of 1.5MtC in 2020 in addition to the savings the Renewables Obligation has already delivered. 1.5MtC is the equivalent of saving the emissions from two large (1GW) gas fired power stations.

Carbon Capture and Storage has the potential to eliminate 80 - 90% of the CO₂ emissions from coal-use, not only in power generation but also in other industrial processes.

We are substantially increasing our spending on energy R&D from £40m/year in 2005/6 to £70m/year in 2007/8 to bring on new clean technology.

October 2006

Past reports from the Environmental Audit Committee since 1997

2006-07 Session

First The UN Millennium Ecosystem Assessment, HC 77

2005-06 Session

First Greening Government: the 2004 Sustainable Development in Government Report, HC 698

Second Sustainable Timber, HC 607

Third Sustainable Procurement: the Way Forward, HC 740

Fourth Pre-Budget 2005: Tax, economic analysis, and climate change, HC 882

Fifth Sustainable Housing: A follow-up report, HC 779

Sixth Keeping the lights on: Nuclear, Renewables, and Climate Change, HC 584

2004-05 Session

First Housing: Building a Sustainable Future, HC 135

Second Corporate Environmental Crime, HC 136

Third World Summit on Sustainable Development 2002: A UK Progress Report, HC 381

Fourth The International Challenge of Climate Change: UK Leadership in the G8 and EU, HC 105 (*Reply Cm6617*)

Fifth Environmental Education: Follow-up to Learning the Sustainability Lesson, HC84 (*Reply Cm6594*)

Sixth Sustainable Public Procurement , HC 266

Seventh Pre-Budget 04 and Budget 05, HC 261 (*Reply HC 528*)

2003-04 Session

First Annual Report 2003, HC 214

Second GM Foods – Evaluating the Farm Scale Trials, HC 90

Third Pre-Budget Report 2003: Aviation follow-up, HC 233

Fourth Water: The Periodic Review 2004 and the Environmental Programme, HC 416 (*Reply, HC 950*)

Fifth GM Foods – Evaluating the Farm Scale Trials, HC 564

Sixth Environmental Crime and the Courts, HC 126 (*Reply, HC 1232*)

Seventh Aviation: Sustainability and the Government Response, HC 623 (*reply, HC1063*)

Eighth Greening Government 2004, HC 881 (*Reply, HC 1259*)

Ninth Fly-tipping, Fly-posting, Litter, Graffiti and Noise, HC 445 (*Reply, HC 1232*)

Tenth Budget 2004 and Energy, HC 490 (*Reply, HC 1183*)

Eleventh Aviation: Sustainability and the Government's second response, HC1063

Twelfth Environmental Crime: Wildlife Crime, HC 605 (*Reply, HC 438*)

Thirteenth Sustainable Development : the UK Strategy, HC 624

2002-03 Session

First Pesticides: The Voluntary Initiative, HC100 (*Reply, HC 443*)

Second	Johannesburg and Back: The World Summit on Sustainable Development–Committee delegation report on proceedings, HC 169
Third	Annual Report, HC 262
Fourth	Pre-Budget 2002, HC 167 (<i>Reply, HC 688</i>)
Fifth	Waste – An Audit, HC 99 (<i>Reply, HC 1081</i>)
Sixth	Buying Time for Forests: Timber Trade and Public Procurement - The Government Response, HC 909
Seventh	Export Credits Guarantee Department and Sustainable Development, HC 689 (<i>Reply, HC 1238</i>)
Eighth	Energy White Paper – Empowering Change?, HC 618
Ninth	Budget 2003 and Aviation, HC 672 (<i>Reply, Cm 6063</i>)
Tenth	Learning the Sustainability Lesson, HC 472 (<i>Reply, HC 1221</i>)
Eleventh	Sustainable Development Headline Indicators, HC 1080 (<i>Reply, HC 320</i>)
Twelfth	World Summit for Sustainable Development – From rhetoric to reality, HC 98 (<i>Reply, HC 232</i>)
Thirteenth	Greening Government 2003, HC 961 (<i>Reply, HC 489,2003-04</i>)

2001-02 Session

First	Departmental Responsibilities for Sustainable Development, HC 326 (<i>Reply, Cm 5519</i>)
Second	Pre-Budget Report 2001: <i>A New Agenda?</i> , HC 363 (<i>HC 1000</i>)
Third	UK Preparations for the World Summit on Sustainable Development, HC 616 (<i>Reply, Cm 5558</i>)
Fourth	Measuring the Quality of Life: The Sustainable Development Headline Indicators, HC 824 (<i>Reply, Cm 5650</i>)
Fifth	A Sustainable Energy Strategy? Renewables and the PIU Review, HC 582 (<i>Reply, HC 471</i>)
Sixth	Buying Time for Forests: <i>Timber Trade and Public Procurement</i> , HC 792-I, (<i>Reply, HC 909, Session 2002-03</i>)

2000-01 Session

First	Environmental Audit: <i>the first Parliament</i> , HC 67 (<i>Reply, Cm 5098</i>)
Second	The Pre-Budget Report 2000: <i>fuelling the debate</i> , HC 71 (<i>Reply HC 216, Session 2001-02</i>)

1999-2000 Session

First	EU Policy and the Environment: An Agenda for the Helsinki Summit, HC 44 (<i>Reply, HC 68</i>)
Second	World Trade and Sustainable Development: An Agenda for the Seattle Summit, HC 45 (Including the Government response to the First Report 1998-99: Multilateral Agreement on Investment, HC 58) (<i>Reply, HC 69</i>)
Third	Comprehensive Spending Review: Government response and follow-up, HC 233 (<i>Reply, HC 70, Session 2000-01</i>)
Fourth	The Pre-Budget Report 1999: pesticides, aggregates and the Climate Change Levy, HC 76
Fifth	The Greening Government Initiative: first annual report from the Green Ministers Committee 1998/99, HC 341
Sixth	Budget 2000 and the Environment etc., HC 404
Seventh	Water Prices and the Environment, HC 597 (<i>Reply, HC 290, Session 2000-01</i>)

1998-99 Session

First	The Multilateral Agreement on Investment, HC 58 (<i>Reply, HC 45, Session 1999-2000</i>)
Second	Climate Change: Government response and follow-up, HC 88
Third	The Comprehensive Spending Review and Public Service Agreements, HC 92 (<i>Reply, HC 233, Session 1999-2000</i>)
Fourth	The Pre-Budget Report 1998, HC 93
Fifth	GMOs and the Environment: Coordination of Government Policy, HC 384 (<i>Reply Cm 4528</i>)
Sixth	The Greening Government Initiative 1999, HC 426
Seventh	Energy Efficiency, HC 159 (<i>Reply, HC 571, Session 2000-01</i>)
Eighth	The Budget 1999: Environmental Implications, HC 326

1997-98 Session

First	The Pre-Budget Report, HC 547 (<i>Reply, HC 985</i>)
Second	The Greening Government Initiative, HC 517 (<i>Reply, HC 426, Session 1998-99</i>)
Third	The Pre-Budget Report: Government response and follow-up, HC 985
Fourth	Climate Change: UK Emission Reduction Targets and Audit Arrangements, HC 899 (<i>Reply, HC 88, Session 1998-99</i>)
