

## WWF-UK Response to the Energy Review

### INTRODUCTION

WWF regards climate change as one of the most serious threats facing the planet and human development, and one which demands urgent global action. To prevent average global temperatures from increasing by more than 2°C above pre-industrial levels – a threshold above which the risk of severe and irreversible tipping points in the climate becomes increasingly likely – the world's emissions of greenhouse gases will need to peak and start to fall within the next 10-15 years.

We commend the Government for recognising the urgency and importance of the climate change issue in its 2003 Energy White Paper, and in its presidency of the G8 last year. The Government's target to reduce the UK's CO<sub>2</sub> emissions by 20% from 1990 levels by 2010, and the White Paper's goal of a 60% reduction by 2050, are essential elements of its attempts to demonstrate global leadership on the issue.

Unfortunately, real progress in reducing emissions is much less impressive. Provisional data for 2005 show that CO<sub>2</sub> emissions are now just 5.3% below 1990 levels. Total emissions have increased by 2.3% since 1997 – with the main culprit being the power sector, which has seen a 15% increase in emissions.<sup>1</sup> Moreover, the DTI's latest projections show virtually no reduction in emissions by 2020 under current policies.<sup>2</sup>

In March, the Government effectively abandoned its 20% CO<sub>2</sub> reduction target for 2010.<sup>3</sup> The revised climate change programme put forward policies to deliver a reduction of just 15-18%. WWF condemns this move – and believes that the main reason for the abandonment of the target is that the Government's has failed to set a sufficiently tight cap on the power sector under the EU Emissions Trading Scheme (EUETS).

**WWF is convinced that the Energy White Paper's focus on energy efficiency and renewables was the right approach to addressing climate change. The current energy review should be used as an excellent opportunity to reassert the vision set out in the White Paper, and to ensure that it is implemented vigorously.** It is important that the review addresses transport (including aviation) and heat as well as simply the electricity sector.

However, WWF and many other stakeholders remain concerned that the energy review may simply be a smokescreen to support new nuclear build. This perception is reinforced by the Government's decision to reopen the nuclear question just three years after the White Paper. **WWF regards nuclear power as a costly, dangerous and fundamentally unsustainable technology. Our modelling work confirms that by 2025 very substantial reductions in power sector emissions can be achieved without new nuclear**

<sup>1</sup> Energy Trends, March 2006.

<sup>2</sup> UK energy and CO<sub>2</sub> emissions projections: Updated projections to 2020, February 2006.

<sup>3</sup> The UK Climate Change Programme 2006, March 2006.

**build. For the sake of future generations, the Government must focus its efforts on resolving the nuclear waste problem – any move to build new reactors would fatally undermine this.**

Modelling work to inform this response also confirms that **the Government must take further action to tackle emissions from the current fleet of highly polluting coal-fired power stations, over and above the signal provided by carbon prices under the EU emissions trading scheme.** Without such measures, it is likely that many coal stations will still be running at a high load factor even by 2020, when most will be some 50 years old.

The problems to date in achieving progress towards Government targets on CO<sub>2</sub> and renewable energy, and the failure to deliver the promised “step change” in energy efficiency, demonstrate the need for a new, strong focus across Whitehall on ensuring that all relevant policies contribute actively to a steady reduction in emissions.

This is why WWF, as part of the broad Stop Climate Chaos coalition<sup>4</sup> of international development organisations, environmental groups, faith-based groups and other representatives of civil society, is calling for a **Carbon Budget that cuts emissions each year and which covers all sectors of the economy. We urge the Government to adopt this Carbon Budget approach in the current energy review.**

Finally, WWF is convinced that **it will be impossible to deliver a sustainable energy system for the UK without action to curb, and eventually reduce, energy demand.** So far, policy has focused on promoting energy efficiency – but the numerous policies and actors form a confusing picture, and the effectiveness of the whole is often difficult to assess. **WWF calls on the Government to introduce changes to the electricity and gas markets to make the provision of energy services, rather than bulk energy sales, a viable core business model. To that end, we support the Energy Saving Trust’s proposal for a cap and trade scheme on domestic energy supply which would open up a new and exciting market for energy service companies.**<sup>5</sup>

We attach the following supplementary documents to support this response:

- 1 **A new report by Ilex Energy Consulting** looking at three scenarios for CO<sub>2</sub> emissions and fuel mix for the UK power sector for 2010, 2016, 2020 and 2025. **The report concludes that by 2025 CO<sub>2</sub> emissions could be cut by 43-55% from 1990 levels without the need for new nuclear capacity.** In contrast, under business as usual emissions would fall by just 18%.
- 2 **A joint statement setting out a vision for a sustainable energy policy**, supported by WWF and a wide range of trade associations, Government agencies and advisory bodies, professional institutions and environmental organisations.

---

<sup>4</sup> More information on [www.stopclimatechaos.org](http://www.stopclimatechaos.org)

<sup>5</sup> EST submission to energy innovation review, December 2005.

## RESPONSES TO MAIN CONSULTATION QUESTIONS:

Q1. What more could the Government do on the demand or supply side for energy to ensure that the UK's long-term goal of reducing carbon emissions is met?

WWF believes that this question approaches the problem from the wrong direction. The key question is how the Government can best ensure that its long-term goal of reducing carbon emissions is met – and what would the implications then be for the demand and supply side?

The vital missing component in existing climate and energy policy is a firm trajectory for emissions to give real force to the existing CO<sub>2</sub> reduction targets for 2010 and 2050. Such a trajectory would ensure continued focus in Whitehall on delivery of climate change objectives, as well as providing much greater certainty to business to inform its investment decisions.

**This is why WWF, as part of the Stop Climate Chaos coalition, is calling on the Government to introduce a Carbon Budget that would set year-on-year emission reduction targets across the economy as a whole, backed by full and transparent reporting to Parliament. The Carbon Budget could be reinforced by also setting emissions reduction targets for the devolved administrations and English regions.**

The demand side

Numerous studies – including analytical work underpinning the Energy White Paper – have concluded that energy efficiency is an extremely cost-effective option to reduce CO<sub>2</sub> emissions. It also supports the Government's wider objectives on energy security and fuel poverty.

Modelling of the UK power sector by Ilex Energy Consulting, carried out for WWF to inform this response, confirms that reducing demand for electricity is central to delivering significant emission reductions from the power sector by 2025 – without the need for any new nuclear capacity. Reduced demand leads to a much reduced investment in new capacity, with corresponding reduction in wider environmental impacts such as air pollution, waste and visual impacts.

It is disappointing, therefore, that the Energy White Paper's promise of a "step change" on energy efficiency has failed to materialise. In most sectors of the economy, energy demand continues to rise. Part of the problem may be that existing policy on energy efficiency is confused, piecemeal and focused on levels of activity as much as on outcomes. Many organisations in the public, private and voluntary sectors are doing excellent work to promote energy efficiency – but there is a lack of clear responsibility for overall delivery. This is mirrored in the split in responsibility within Whitehall, with DEFRA overseeing energy efficiency and the DTI taking the rest of energy policy.

**WWF believes that it is time to refocus policy on the ultimate objective for a sustainable energy system – reducing absolute demand for energy.** Energy efficiency is the tool to deliver this goal, not an end in itself.

In December, the Energy Saving Trust (EST) published a wide-ranging report to Government into the options for promoting energy efficiency in the household sector.<sup>6</sup> This put forward a range of policies to deliver the significant potential for energy saving, including tougher building regulations and appliance standards, which we support.

---

<sup>6</sup> Energy efficiency innovation review: Household sector – final report, December 2006.

However, WWF believes that one of the EST's main recommendations – a transformation of the current Energy Efficiency Commitment on gas and electricity supply companies into a supplier cap and trade scheme – has the potential to revolutionise the delivery of energy efficiency measures. Placing a cap on total gas and electricity supply would force supply companies to embrace a new, exciting business model based on provision of energy services. Previous efforts to promote energy service companies (ESCOs) have been hampered by the fact that the existing market structure and regulation is based around provision of energy as a commodity. **WWF urges the Government to adopt a supplier cap and trade scheme, as proposed by the EST, in order to deliver a full and effective transition to a market in energy services.**

A wide range of other policies could help to reduce demand for energy in the **household, business and transport sectors**, and are discussed in response to Question i.

**However, one prime candidate which the Government should bring forward as soon as possible is the Carbon Trust's proposal for a new UK emissions trading scheme for larger, less energy-intensive organisations.**

Energy demand should also be reduced by careful design of all new infrastructure. A good example of the need to think creatively about infrastructure costs and provision is the programme to build new housing. The Government must ensure that all new communities have “low carbon infrastructure” as standard – including very efficient homes and buildings, low/zero carbon energy generation, local facilities and amenities, mixed use and green transport links. Research by the Environment Agency shows that building “standard” infrastructure in the Thames Gateway will cost £35-65,000 per unit, while research by WWF/BioRegional demonstrates “sustainable” infrastructure could cost as little as £22,000 per unit.<sup>7</sup>

The supply side

There are also a wide range of actions which could be taken on the supply side. In this section of our response, we discuss the role of the **EU emissions trading scheme**; the need to tackle the ageing **coal fired power stations**; and measures to speed the development of **renewable energy**.

We set out our arguments for opposing new **nuclear** build in response to Question 3, and discuss the potential role of **carbon capture and storage** and **microgeneration** in response to Question 4.

#### **A. The EU emissions trading scheme (EUETS)**

WWF agrees with the Government's previous statements that the EUETS is an essential mechanism for reducing emissions from the power sector and heavy industry. Properly designed and implemented, the scheme could provide a major incentive for efficiency, fuel switching and investment in lower carbon technologies.

As a result, we are extremely disappointed at the weak cap proposed by the Government for Phase II of the scheme which would, at the less demanding end of the range, allow an increase in emissions from Phase I. This sets a very worrying precedent for the future of the scheme. **WWF urges the Government to set a much more stringent cap on the power sector for Phase II. We support an overall cap of around 60 million tonnes of carbon per annum for the traded sector – a level which would ensure deliver of the 20% CO<sub>2</sub> reduction target for 2010.**

---

<sup>7</sup> Enabling One Planet Living in the Thames Gateway, BioRegional, 2005.

Last year, WWF engaged consultants to provide detailed reports on how the design and implementation of the EUETS could be improved to ensure maximum environmental and economic efficiency.<sup>8</sup>

Building on that report, we make the following specific recommendations:

- With regard to allocation methodology, the Government should:
  - **employ the maximum amount of auctioning** in Phase II (10%) and 100% auctioning in Phase III of the scheme and beyond. This would simplify the allocation process, send a clear signal to existing coal fired power stations that they will incur high up front costs, and encourage investors to consider low-carbon technologies;
  - in advance of 100% auctioning, consider introducing a **windfall tax** on the power sector. According to a recent report to the DTI, in Phase I the power generators are making windfall profits of £800 million per year (or £1.4 billion per year at current carbon prices);
  - in advance of 100% auctioning, move away from fuel-specific benchmarking, which favours existing carbon-intensive coal fired power stations, to a single benchmark for the power sector;
- invest any revenue that is raised – either through auctioning of allowances or via a windfall tax – in the further development and implementation of low carbon technologies. The Government could also consider measures to compensate the few industrial sectors which are most exposed to international competition as a result of the impact of the EUETS on electricity prices (provided this is compatible with state aid rules);
- set tough quantitative **limits on the use of overseas emissions credits** to ensure that domestic (EU) action to reduce emissions is a priority. Qualitative criteria should also be introduced to allow only credits from Gold Standard renewable energy or energy efficiency projects. (The Gold Standard is an internationally recognised benchmark which sets sustainable development criteria for emission reduction projects. See <http://www.cdmgoldstandard.org/>).

At present, one major concern with the EUETS is that there is insufficient certainty on future carbon prices, or allocation methodologies, to influence investment decisions in favour of low carbon technologies. **In order to ensure the necessary long term certainty for business, WWF believes that the UK government should:**

- make a clear commitment that future allocations for new and existing plant will be based on 100% auctioning;
- provide strong early signals on medium and longer term emissions reduction targets for sectors under the ETS. This would follow from the establishment of an annual Carbon Budget; and
- call on the European Commission and other Member States to send a clear signal that EUETS will continue beyond 2012. There may be a case to move towards phases which are longer than five years to better tie in with industry investment cycles.

WWF is aware of other proposals to establish long-term carbon contracts between Government and business to overcome investment uncertainties over future carbon prices.<sup>9</sup> This has some attractions, but would essentially involve the Government underwriting the risks for major industry sectors and is likely to be an inappropriate risk to the public purse. Moreover, the structure of long-term contracts may well be designed to offer implicit support for nuclear power, as they could tend to favour capital-intensive,

---

<sup>8</sup> See [http://www.wwf.org.uk/filelibrary/pdf/ets\\_uk\\_summary.pdf](http://www.wwf.org.uk/filelibrary/pdf/ets_uk_summary.pdf)

<sup>9</sup> For example <http://www.dieterhelm.co.uk/publications/CarbonContractsOct05.pdf>

high risk technologies. WWF is opposed in principle to any move to offer explicit or implicit support for nuclear power, for reasons set out in response to Question 3.

#### **B. Coal-fired power stations**

As long as coal plays a major role in the UK's electricity energy mix the goal of achieving a low carbon economy will continue to elude us. CO<sub>2</sub> emissions from the power sector have risen by 15% since 1997 because of increased demand and a switch back from gas to coal.

Moreover, the DTI's latest emissions projections show that coal could still account for approximately 21% of the electricity mix in 2020 – and that power sector emissions will be little changed from current levels<sup>10</sup>. These projections do not take account of the EUETS, which will tend to decrease coal burn. However, the Ilex study for WWF does include the EUETS in its business as usual scenario, and also shows a significant ongoing contribution from coal under business as usual.

**The Government's prolonged indecision over implementation of the EU large combustion plant Directive (LCPD) has exacerbated the situation.** The delay has meant that unexpectedly large numbers of coal-fired stations have opted in to the LCPD, which will allow them to run at high load factors to 2016 and beyond. Many hundreds of millions of pounds will be invested in fitting FGD, and after 2016, NO<sub>x</sub> abatement to these stations. WWF regards this as a case of throwing good money after bad – the cash would have been better spent on developing and implementing renewable and energy efficient technologies which will help the UK's transition to a low-carbon economy.

By 2020, almost all of the UK's coal-fired power stations will be 45-50 years old or more. They have a low thermal efficiency, which will be decreased still further by the requirement to fit energy-intensive SO<sub>2</sub> and NO<sub>x</sub> abatement equipment under the LCPD. **WWF regards it as unacceptable that such old, inefficient plant could continue to play a significant role in the future UK power mix in 2020, by which time global CO<sub>2</sub> emissions will need to be on a steep downward trend.**

To ensure that CO<sub>2</sub> emissions from coal fired power stations are put on a significant downward path – vital for delivering our long-term climate change obligations – WWF recommends that the Government:

- set tight caps under the EUETS, particularly for coal fired power stations;
- progress to 100% auctioning in Phase III of the EUETS, and abandon fuel-specific benchmarks for Phase II;
- provide strong early signals on medium and longer term emissions reductions targets e.g. through the establishment of an annual carbon budget;
- **consider introducing additional regulations from 2015 to ensure that gas-fired plant always operate ahead of coal-fired plant.** By 2020, remaining coal-fired capacity should only be used in periods of peak demand and to balance any intermittency from renewable generation; and
- regulate to ensure that no new coal-fired plants are built in the UK without Carbon Capture and Storage (CCS) technology.

We discuss the wider potential for CCS in our response to Question 4.

---

<sup>10</sup> DTI projections [http://www.dti.gov.uk/energy/sepn/uep\\_feb2006.pdf](http://www.dti.gov.uk/energy/sepn/uep_feb2006.pdf)

### **C. Renewable energy**

The Energy White Paper saw renewables and energy efficiency as the key priorities in developing a sustainable energy system, and set an aspirational target for renewables to supply 20% of the UK's electricity by 2020. Renewables can be built quickly and cleanly – especially when compared to nuclear power – and offer considerably lower life cycle costs, as confirmed by the technology matrix prepared for WWF (see supplementary documents). Targets for renewable heat and transport fuels are also required (please see our response to question iv. below for more details).

**WWF calls on the Government to bring forward policies which will ensure delivery of the 20% target, and to introduce a further target to increase renewable output to 25% by 2025.** In doing so, the Government should recognise and compensate for the fact that the renewables obligation, the main support mechanism, has a built-in shortfall against targets because of the way in which buy-out payments are recycled. **The Government should also consider whether other measures, such as a banded obligation or supplementary feed-in tariffs, should be introduced to offer targetted support to less developed and more costly renewables such as marine technologies and biomass.**

Within this wider target WWF also look forward to devolved administrations implementing firm policies to ensure the delivery of their individual renewable energy targets, such as 18% of electricity by 2010 and 40% by 2020 for Scotland, and 4TWh of electricity per annum to be produced by renewable energy by 2010 and 7TWh by 2020 for Wales.

It also is important to recognise that measures to reduce electricity demand will make percentage targets for renewables considerably easier to deliver.

The UK has a vast potential renewable energy resource, particularly in wind and wave power. However, these resources are still largely untapped. The Government needs to give clearer signals and policies to bring forward the development of existing and new renewable technologies. It should be born in mind that nuclear and fossil fuel industries have historically benefited from huge implicit and explicit subsidies to bring them to their current state of development.

According to the British Wind Energy Association, onshore wind capacity is set to reach 6,000MW by 2010 and to generate almost 5% of UK electricity supply – thus delivering nearly half of the Government's 2010 renewable energy target.<sup>11</sup> Half of this capacity is already confirmed for delivery, and the BWEA identifies a further 3,000MW which is expected to be consented and built by 2010. It is important that the Government ensures that the full benefits of onshore wind are fully recognised in the planning process, and that concerns over local impacts – which are often overstated – are not used as an unreasonable barrier to development.

However, progress on offshore wind – which is critical to delivery of the Government's renewables targets for 2010 and 2020 – has stalled badly. The BWEA<sup>12</sup> warns that under current policies only 2,000MW of offshore wind capacity will be installed by 2015 – compared to a realistic potential of 8,000MW with additional support from Government. **WWF calls on the Government to act urgently to ensure that the offshore wind industry continues to develop at the pace necessary to meet renewable energy targets.**

---

<sup>11</sup> Report by the BWEA, Onshore Wind: Powering Ahead, March 2006.

<sup>12</sup> Report by the BWEA, Offshore Wind: At a Crossroads, April 2006.

Offshore wind should not be subject to an exclusion zone around the UK coast on the basis of visual impact, as no other industry is restricted on such a wholesale and arbitrary manner. The near shore zone is the most commercially viable area and so imposing an exclusion zone around the UK coast to 12 nautical miles would severely restrict this industry.

Furthermore, a new report by the UK Energy Research Centre (UKERC) and the Carbon Trust<sup>13</sup> confirms that claims that wind power is expensive and intermittent have been greatly exaggerated. This study confirms that variable electricity generation from renewable sources, such as wind, need not compromise the reliability of the electricity system at any level of penetration foreseeable in the UK over the next 20 years. Another key finding was that if wind power were to supply 20% of Britain's electricity, intermittency costs would be 0.5-0.8p/kWh of wind output.

Overall, the Government must refocus attention and political will to create a thriving UK renewables industry. This should include significant new funding to bring forward the less commercially developed renewable technologies, such as wave, tidal turbines and biomass.

**However, WWF is concerned at reports that the Welsh Assembly Government is planning to support construction of the Severn Tidal Barrage. This project would entail high financial costs and cause devastating environmental impacts to the estuary and should not be supported.**

Construction of a Severn Tidal Barrage (STB) would have a direct impact on four sites protected under European conservation legislation: the Severn Estuary Special Protection Area, and proposed Special Area of Conservation, and the rivers Wye and Usk SACs. Once destroyed, this huge natural asset cannot be recreated.

A project such as this would have to pass the stringent tests contained in the EU Birds and Habitats Directives: that there were no alternative solutions and there were imperative reasons of over-riding public interest as to why the scheme should proceed. Even if these tests were considered to have been passed, then compensatory habitat would have to be provided in order to maintain the coherence of the Natura 2000 network. Notwithstanding the irreplaceability of the ecosystem as a whole, this last requirement is likely to prove especially difficult to meet in the context of the Severn.

WWF fears that wider support to the renewables industry will be negated if the Severn Estuary Barrage is developed, as it would divert desperately needed investment away from alternative and less environmentally damaging renewable energy technologies, such as wave power and current turbines. If the government invested similar level of funds into alternative marine renewable energy technologies to the proposed cost of the barrage (around £10-15billion), it is possible that a greater contribution to the renewables industry can be made and with less impact on the wildlife of the Severn Estuary.

WWF is also concerned about the considerable wider environmental impacts associated with construction of a traditional barrage across the Severn Estuary, including sourcing of construction materials. We consider any STB project proposal and project should be subject to a full sustainability appraisal, especially as it is likely to be presented to the public as an otherwise "green" project making a substantial contribution to UK emissions reduction. Its overall cost-effectiveness, eco-efficiency in terms of CO<sub>2</sub> balance and its impact on biodiversity and the wider natural environment should also be fully assessed against other renewable energy options.

---

<sup>13</sup> Report by the UKERC, The Costs and Impacts of Intermittency, April 2006.

**WWF also believes that new marine and coastal renewable energy developments should take place within an effective Marine Spatial Planning (MSP) framework**, underpinned by Strategic Environmental Assessments (SEAs) and risk assessment. There is enormous potential for renewable energy in the UK marine environment and the development of these technologies should be encouraged, provided new projects are developed in a sustainable manner, have minimal adverse impact on marine wildlife and do not affect the integrity of internationally and nationally important marine and coastal nature conservation features, especially in MPAs.

Q2. With the UK becoming a net energy importer and with big investments to be made over the next twenty years in generating capacity and networks, what further steps, if any, should the Government take to develop our market framework for delivering reliable energy supplies? In particular, we invite views on the implications of increased dependence on gas imports.

Gas is a finite fossil fuel, with limited global reserves compared to coal. Moreover, there are clear concerns over the energy security implications and price implications of relying on gas. Burning gas also contributes significantly to total CO<sub>2</sub> emissions. For both these reasons, it is essential that gas is used in the most efficient way to deliver maximum CO<sub>2</sub> emission reductions.

The public debate on gas security is almost exclusively dominated, wrongly in WWF's view, by use of the fuel in the power sector. In 2004, electricity generation (including auto-generation) accounted for 30% of total gas use in the UK. Other sectors of the economy are also hugely dependent on gas, including household heating (35% of total gas use in 2004) and manufacturing industry (21%).

The UK economy is thus already highly dependent on gas. There is significant potential to reduce the demand for gas across the economy as a whole – particularly through energy efficiency measures focusing on heat use in the domestic, commercial and industrial sectors, promoted by the types of policies highlighted elsewhere in this response. There is also considerable potential to increase the share of alternative fuels in these markets, particularly the use of solar thermal and biomass for heat.

It is worth highlighting that many of the current concerns over gas security are exacerbated by short-term issues arising from lack of storage and inter-connector capacity, slow progress in liberalisation of EU energy markets and price spikes driven partly by the link with oil prices. These are not trivial issues, but with strong policy focus at UK, EU and international level significant progress could be made in these areas – thus doing much to ease concerns over gas supplies in the time period addressed by the energy review.

The use of imported gas has become particularly sensitive in the UK because of the coincidental switch from being a net exporter to a net importer. However, this switch is far from being a surprise – indeed, it was fully considered in the Energy White Paper, which correctly pointed out that most other developed nations rely on internationally traded fuels to meet their energy needs. This confirms that the focus should be on securing a sound basis for open access to these international markets.

**Overall, it is clear that the UK will be reliant on significant volumes of imported natural gas for several decades at least regardless of decisions on the use of gas for electricity generation. This dictates that policies to ensure reliable and open global supplies of natural gas should be seen as a priority for both energy and foreign policy.**

Use of gas for power generation

In this context, it must be recognised that gas seems certain to play an increasing role in power generation, either in centralised power stations or, increasingly, in combined heat and power and micro-generation units. WWF accepts that gas has a role to play as a relatively clean bridging fuel to enable a transition towards a truly low-carbon energy system.

The DTI's draft energy projections show that gas power stations are expected to supply 54-60% of electricity in 2020 – and this is before the impact of carbon prices in the EUETS is taken into account.

The report by Ilex to WWF confirms this conclusion (see supplementary papers). Overall, under Ilex's business as usual scenario gas will contribute 56% of generation in 2020 and 62% by 2025. This BAU scenario differs from the DTI's, in that it includes the impact of the EUETS.

Ilex also modelled two alternative scenarios which aim to deliver ongoing reductions in CO<sub>2</sub> emissions of 43-55% from 1990 levels by 2025 through relatively modest policies to reduce the growth in electricity demand and to promote renewables, CHP and micro-generation. In both scenarios, gas accounts for 65% of the power market in 2025 – but compared to business as usual the absolute level of gas use is 11-16% lower. **Thus absolute levels of gas use for power generation should be managed by giving strong priority to reducing electricity demand and promoting ongoing development of renewables beyond 2020.**

Moreover, relatively high levels of gas use by 2025 are not surprising, given that this period coincides with the closure of almost all nuclear and coal capacity. Beyond 2025, gas use could be expected to decline through policies to reduce electricity demand, further development in renewables and technological innovation, potentially including carbon capture and storage.

**Carbon capture and storage (CCS) is a potentially viable option to further reduce reliance on gas for power generation while ensuring ongoing reductions in CO<sub>2</sub> emissions.** It appears possible that CCS could be brought forward on a considerably faster timescale than nuclear, as confirmed by the growing number of proposed projects both the UK and elsewhere in Europe, provided rapid progress is made to resolve a range of legal, technical and financial issues. CCS could be used with either coal or gas, but is particularly attractive with coal as this allows greater diversity in the fuel mix. WWF's wider views on CCS are discussed in our response to question 4.

The nuclear industry claims that it offers an alternative to increased dependence on natural gas. This case is fatally flawed, however. Putting aside the fundamental barriers to new nuclear build (discussed in answer to question 3), Ilex's report confirms that most of the increase in gas capacity will be required by 2016. Even on the nuclear industry's own highly optimistic timetable, the first new reactor could not be commissioned by that date – while building significant capacity through a series of 8-10 reactors would take many more years.

Q3. The Energy White Paper left open the option of nuclear new build. Are there particular considerations that should apply to nuclear as the Government re-examines the issues bearing on new build, including long-term liabilities and waste management? If so, what are these, and how should the Government address them?

Just three years ago, the Energy White Paper conspicuously failed to support the case for new nuclear build. It concluded that the economics at the time made nuclear an “unattractive option for new, carbon-free generating capacity and there are also important issues of nuclear waste to be resolved.”

WWF believes that this was, and continues to be, the right conclusion. Despite subsequent increases in fossil fuel prices, the economics of nuclear remain extremely speculative. Moreover, progress towards a “resolution” of the waste problem is slow – and in danger of being fatally undermined by any decision to proceed with new build. Along with many other observers, we are concerned by reports claiming that the Government has already made up its mind on the issue – and are sceptical that circumstances have changed so dramatically since the Energy White Paper as to force such an early rethink.

In March, the Sustainable Development Commission completed an exhaustive investigation into the case for nuclear.<sup>14</sup> In a balanced and well-reasoned report, the Commission concluded that “there is no justification for bringing forward plans for a new nuclear power programme, at this time, and that any such proposal would be incompatible with the Government’s own Sustainable Development Strategy.” Instead, it called for an aggressive suite of policies on energy efficiency and renewables, with the development of CCS technologies and a large-scale low carbon innovation programme – all underpinned by long term targets for absolute reductions in CO<sub>2</sub> emissions. **WWF fully endorses the Sustainable Development Commission’s conclusions.**

A range of studies and scenarios have concluded that the Government’s long-term CO<sub>2</sub> reduction targets can be met without nuclear power, including work by the Royal Commission on Environmental Pollution, the Tyndall Centre for Climate Change Research and work underpinning both the Performance and Innovation Unit’s report to Government and the 2003 Energy White Paper. The SDC makes clear that new nuclear is “a choice rather than an absolute necessity.”

These conclusions are reinforced by the report to WWF by Ilex, which models the UK power sector under a range of scenarios up to 2025 (see supplementary report). **Ilex concludes that by 2025 relatively modest extension of existing policies and targets could reduce the power sector’s CO<sub>2</sub> emissions by 55% from 1990 levels without new nuclear. This compares to a business as usual reduction of just 18%.**

There are many reasons why we believe nuclear build is not a viable power generation option including:

- true life-cycle cost, including decommissioning, waste management and insurance, and the unquantifiable risks attached to this. The technology matrix prepared by WWF (provided as supplementary report) provides ample evidence to support this view;<sup>15</sup>
- the lack of a solution to the nuclear waste problem;
- safety, proliferation and security risks – not least because a decision to back nuclear build in the UK would open the door to use of the technology in other countries which may have less rigorous regulatory standards or governance, and which may also wish to acquire nuclear weapons;
- nuclear will lock the UK into an inflexible, centralised power system;
- a new nuclear programme is likely to reduce political support and private investment in energy efficiency and renewables;

---

<sup>14</sup> The role of nuclear power in a low carbon economy, Sustainable Development Commission, March 2006.

<sup>15</sup> Please note; in the Technology Matrix appendix the nuclear costs do not include the insurance costs for accidents, grid connections or losses of electricity on the grid costs, whereas cost estimates for other sectors, such as wind energy usually includes these additional costs. However, all technologies should be costed by government consistently and fully.

- the first new nuclear reactor could not be commissioned much before 2020 on any but the most optimistic of scenarios – too late to fill the claimed “energy gap” or to contribute towards the need to make urgent reductions in the UK’s CO<sub>2</sub> emissions;
- nuclear is incompatible with the liberalised energy markets, particularly if a series build of identical reactors is proposed;
- uranium is a finite resource, and its exploitation causes serious local environmental impacts;
- as existing stocks of uranium are depleted, poorer grade ores will be exploited. Nuclear power is not a zero carbon technology, as extraction, fuel production and construction of nuclear plants are highly energy intensive processes. The move to lower grade ores will seriously erode the claimed low-carbon benefits of nuclear power;
- the potential carbon savings need to be put in perspective – according to the SDC, replacing the UK’s existing reactors with 10GW of new capacity would deliver a 4% cut in CO<sub>2</sub> emissions from 1990 levels. This would clearly be an important contribution – but nuclear is far from the panacea implied by its supporters. There are many better, safer, more sustainable and cheaper ways of delivering the necessary reductions; and
- nuclear power stations have high marine and coastal environmental impacts, particularly the cumulative impact on fish stocks. The UK and countries under the OSPAR Convention have also committed to prevent the discharge of radionucleotides to the North East Atlantic by 2020 above natural background levels.

WWF is against the building of new nuclear power and wishes to highlight two key issues as being of particular relevance to the review:

The economic case

Significantly, the SDC concluded that it is impossible to assess accurately the economic case for new nuclear power – even in the current era of high gas prices and high carbon prices which should make the economics more favourable.

The industry’s history of cost over-runs inspires little confidence in the claims now being put forward by the nuclear lobby. Claims that nuclear could provide electricity at 2.5p/kWh or less have been made on many occasions over the past few years. But the PIU put costs at 3-4p/kWh – and noted that the generating costs of Sizewell B, the UK’s most modern reactor, were actually around 6p/kWh. The economic case for the only reactor currently under construction in Europe, the EPR in Finland, is shrouded by hidden subsidies.

As the SDC points out, a new nuclear programme carries a strong risk of “moral hazard” – with the Government being forced to deliver public subsidy regardless of its original intentions. The hugely expensive bail-out of British Energy confirms the likelihood of this scenario. Moreover, the recent increase in estimates of the UK’s civil nuclear liabilities to £70 billion – with further substantial increases expected to follow – reinforces concerns that “giving the green light” to new nuclear build is an extremely risky strategy which is likely to result in a huge drain on public finances.

Nuclear is an established, mature technology which has benefited from decades of public subsidy in the UK and overseas. Recent estimates show that the nuclear industry has received around \$1 trillion in state support worldwide, compared to \$50 billion for renewable energy.<sup>16</sup> If these massive investments had been made in renewables, the total energy production from these sources would today be huge.

---

<sup>16</sup> Scheer, H (2004) Nuclear Energy belongs in the Technology Museum, WRCE Update, Sept 2004

Moreover, and again in contrast to renewables, nuclear has limited potential for further cost reductions through economies of scale or technological advances. As such, it should not be supported by direct or indirect subsidy by the government or energy users. A range of indirect subsidies or pro-nuclear market distortions include insurance against major accidents, effective underwriting of nuclear liabilities or waste management costs and, potentially, the detailed design of any long-term “carbon contract”.

The industry’s economic case rests on a commitment to a series build of up to 10 new reactors of identical design in order to spread “first of a kind” costs and create economies of scale. This would be supported by rapid “pre-licensing” of the preferred technology by the safety regulators. Such an approach is impossible to reconcile with the Government’s policy of liberalised energy markets and the long-standing reluctance to “pick winners”. It also creates very significant risks to security of supply, as any technical problems could result in simultaneous closure of the entire nuclear fleet.

The industry’s desire to “streamline” the planning and licensing systems to allow more rapid construction of new reactors is extremely worrying – and appears to represent another attempt to distort the market. Such steps would undermine opportunities for legitimate stakeholders, and especially the general public, to engage in the decision-making process.

**Overall, WWF believes that the economics of nuclear are unfavourable, and new reactors could represent a huge drain on public finances regardless of the initial intentions. More importantly, nuclear should also be ruled out by considerations other than cost – the technology is fundamentally incompatible with the wider aims of the Government’s sustainable development strategy.**

Dealing with nuclear waste

The characteristic of nuclear power which most clearly demonstrates its fundamental unsustainability is that it leaves a waste which is dangerous for at least 25,000 years. There is no agreed way forward to deal with the existing wastes – and whatever the chosen option, it will create a major problem for future generations.

The Government has started a process to address the radioactive waste legacy, with the first key milestone being recommendations from the Committee on Radioactive Waste Management which are expected in July. WWF supports the attempt to move forward the process set up under CoRWM. However, it would be highly unwise to expect too much from what is simply a report by a expert committee.

The true test of the process will be the work to follow up and implement CoRWM’s report – which, regardless of the preferred waste management option, will require a highly controversial process of site selection and implementation. Several attempts by previous governments to make progress on dealing with radioactive waste have come badly unstuck at this key stage, most recently with the failed Nirex rock characterisation facility at Sellafield. It would be highly unwise to assume that making progress in future will be any easier.

Indeed, a commitment to new nuclear build is certain to seriously undermine efforts to make progress on radioactive waste. Recent statements from CoRWM confirm that a fleet of new reactors would increase the volume of highly radioactive spent fuel by a factor of five, as well as adding significantly to stockpiles of intermediate and low level waste. Indeed, it should not be assumed that waste from a new generation of reactors could simply be accommodated within a facility set up to handle the existing

legacy – not least because high level waste and spent fuel requires many decades of cooling before it could be placed in a repository. A decision to create more waste would greatly threaten the legitimacy of any consensus around options to tackle the legacy.

**Any government has limited political capital to spend on controversial decisions regarding nuclear – it is vital that this capital is spent on dealing with the dangerous legacy of the nuclear industry rather than on supporting new nuclear build.**

Q4. Are there particular considerations that should apply to carbon abatement and other low-carbon technologies?

Carbon capture and storage

WWF believes that the key to an effective climate change mitigation programme is the reduction in CO<sub>2</sub> emissions by a rapid shift away from the use of fossil fuels. Breaking the addiction to fossil fuels would also help to enhance energy security and reduce the other serious environmental impacts arising from fossil fuel extraction and burning.

Hence, WWF is convinced that increasing renewable energies and energy efficiency, and reducing energy demand and tropical deforestation, are the key ways to combat climate change.

However, we recognise that ensuring that global CO<sub>2</sub> emissions peak within 10-15 years and then fall steeply – as will be needed to ensure that global temperature rise does not exceed 2°C above pre-industrial levels – is a major challenge to the world. This suggests that we may need to accept a role for other carbon abatement technologies such as carbon capture and storage (CCS) in the short to medium term.

WWF does **not** support the direct storage of CO<sub>2</sub> in the open ocean, open aquifers, lakes or on the sea floor. However, WWF believes that CCS schemes involving geological storage of CO<sub>2</sub> in certain rock formations, such as oil and gas fields and/or saline aquifers under the sea could be acceptable, subject to ongoing research into the safety and security of the storage and full assessment of the environmental impacts of each project. Any CCS projects must not interfere with or have significant negative direct or indirect impacts on biodiversity. As a result, detailed SEAs and EIAs must be required before a project is permitted to go ahead. WWF also seeks assurance that the CO<sub>2</sub> must be stored safely and permanently in locations that do not allow any leakage rate or ‘gassing out’ that would be higher than those from conventional natural gas fields; that would mean a permanence time of longer than 100,000 years. This permanence must be assessed and confirmed through independent scientific review.

**WWF is calling for more research into pilot geological storage CCS schemes, particularly in association with new coal plant build overseas, as we recognise the potential importance of this technology in addressing the rapid growth in emissions from emerging coal-dependent economies such as China and India.**

**Subject to the caveats above, WWF is also cautiously supportive of demonstration projects in the UK with industry funding and independent monitoring, in order to help confirm whether or not the CCS technology is environmentally, technologically and economically acceptable.**

CCS should be seen as part of a hierarchy of options – and should not be used to lessen the focus on renewable energy and energy efficiency. Ilex’s report to WWF (see supplementary documents) offers illustrative figures confirming that CCS could potentially help to further reduce carbon emissions and

reduce gas dependency. Under the PS2 scenario, 4GW of CCS capacity could supply some 6% of total electricity demand in 2025 – reducing gas' market share by a corresponding amount. Moreover, 4GW of coal-fired CCS capacity could reduce power sector CO<sub>2</sub> emissions by a further 4 million tonnes (2% of 1990 power sector emissions), assuming it displaces gas-fired CCGTs. WWF also believes there is a need for further research into the life-cycle CO<sub>2</sub> benefits of CCS schemes especially those associated with Enhanced Oil Recovery (EOR).

**There may therefore be a role for CCS in reducing the UK's CO<sub>2</sub> emissions, particularly in light of recent scientific evidence showing that reductions of greater than 60% by 2050 may be necessary. However, if CCS emerges as a viable option the Government should regard it as means to take on more ambitious reduction targets rather than as a tool to deliver existing targets.**

There is considerable potential for CCS to make a significant contribution to emission reductions in Europe. The British Geological Survey (BGS) has estimated that the potential geological storage capacity under the North Sea is around 20 billion tonnes of CO<sub>2</sub> in oil and gas fields, with an additional 20-70 billions tonnes capacity in confined aquifers.

However, CCS is currently an immature technology. Its deployment raises several serious issues, which need to be addressed by the Government before any demonstration projects proceed. These include:

- the legal status of CCS, particularly regarding the OSPAR and London convention on protection of the marine environment, environmental assessments (including whole life-cycle carbon emissions), and systems to issue permits and regulate the activity;
- the liability for long-term storage;
- the feasibility and viability of the new technology; and
- the substantial costs of research, demonstration and deployment.

The emerging status of CCS technologies also means that there is still much uncertainty about their economic feasibility. In March, the Treasury launched a consultation on the barriers to wide-scale commercial deployment of CCS in the UK, and the potential role of economic incentives. WWF will respond to this consultation in due course.

One key question is the treatment of CCS under the EU emissions trading scheme and, more widely, the rules for accounting for emissions under the UN Framework Convention on Climate Change. **WWF believes that it is premature to class CCS as carbon-neutral under Phase II of the ETS. Any move to do so under Phase III and beyond should only take place in the context of international carbon accounting rules agreed under the UNFCCC.**

Moreover, WWF believes that CCS projects should not be funded heavily by the UK Government as this would divert funding away from more sustainable and lower carbon solutions, such as renewable energy and energy efficiency technologies. As it is large corporations (oil, gas and power majors) who will stand to benefit from the widespread global uptake of new CCS schemes, it is they who should pay for the large majority of the R&D funding and investment, and not the UK tax-payer.

**In the meantime, the Government should regulate to ensure that no new coal-fired power station is built in the UK without CCS.** Other so-called “clean coal” technologies, including gasification and supercritical boiler technology, offer relatively modest improvements in thermal efficiency – but without

CCS, CO<sub>2</sub> emissions remain much higher than from gas-fired power stations. All gas-fired plant commissioned after 2012 should be designed to be capture-ready.

#### Microgeneration

WWF welcomes the Government's microgeneration strategy, in particular its recognition that microgeneration can become a key ingredient in a low carbon economy as a realistic alternative energy source in buildings, be it homes or businesses. The buildings sector accounts for 47% of the UK's CO<sub>2</sub> emissions at present and realising the full potential of micro-generation could reduce household emissions by some 15%, while reducing import dependence and transmission losses and benefiting the building owners' and electricity consumers.

WWF also welcomes the related Budget announcement that an additional £50 million will be available to develop microgeneration technologies using part of the funding from the new 3-year Low Carbon Buildings Programme (£80 million in total). The intention is that the extra money will be spent by local authorities, schools and other public bodies using their bulk purchasing capability in order to boost mass production and speed up cost reductions in mass market technologies.<sup>17</sup>

The programme will now make two streams of grants available, split between smaller projects for home owners, community groups and SMEs, and larger projects which include bigger businesses, community organisations and the public sector. WWF supports this clarity of definition and welcomes move to support a range of low carbon technologies including; solar photovoltaics, wind turbines, small hydro, solar thermal hot water, ground/water/air source heat pumps, bio-energy, renewable CHP, micro CHP and fuel cells.

WWF also welcomes the move to require a number of energy efficiency measures are undertaken before building owners are eligible to apply for a grant under the low carbon buildings programme. However, WWF is disappointed that smart metering is not specifically mentioned in this short list of pre-requisites, nor specifically supported by new measures.

However, to deliver a step change in uptake of microrenewables, district heating and micro-CHP and create investor certainty, longer term funding guarantees (over 10-20 years) need to be provided by the Government. **Therefore WWF believes the government should set new and high targets for the level of micro-generation and district heating capacity in the UK, and on a regional basis, for 2010, 2015 and 2020.**

For illustration, one scenario used in Ilex's report for WWF suggests that microgeneration could supply 3% of the UK's electricity by 2020 and 5% by 2025. These figures are consistent with estimates by the Energy Saving Trust that microgeneration could supply 30-40% of the UK's total electricity needs by 2050.

The ODPM's Planning Policy Statement 22 (PPS 22) has given local authorities the power to require "a percentage of the energy to be used in new residential, commercial or industrial developments to come from on-site renewable energy developments." Although this now sets a firm policy framework for local authorities to require embedded generation, the reality is that the market is still failing to provide cost-

---

<sup>17</sup> Please note; sometimes microgeneration schemes, including photovoltaics, compete not with the cost of producing other, grid dependant forms of electricity, as they go straight into use, but with current electricity prices to the consumer.

effective technology options. Without continued, uninterrupted and increased grant schemes from government, local authorities will fail to achieve the planning gain that PPS22 allows.

Q5. What further steps should be taken towards meeting the Government's goals for ensuring that every home is adequately and affordably heated?

The main steps would be a significant increase in energy efficiency in the household sector, with a shift to the provision of energy services driven by a cap on gas and electricity supply. The full range of policies to reduce energy demand in the domestic sector is discussed in response to Question i below.

## RESPONSES TO OTHER SUPPLEMENTARY QUESTIONS

Qi. The long-term potential of energy efficiency measures in the transport, residential, business and public sectors, and how best to achieve that potential.

If the Government is indeed serious about tackling climate change responsibly and effectively, rising energy demand and wasteful consumption must be addressed urgently. Numerous reports by Government agencies and research teams have emphasised the importance of energy efficiency, and measures to reduce wasteful energy consumption have been proven to be the most cost-effective way of reducing CO<sub>2</sub> emissions, with huge economic benefits to the consumer.

The 2003 Energy White Paper aimed to set energy efficiency at the heart of energy policy, promising a “step change” in energy efficiency as the most cost-effective way to meet all of the Government’s energy policy goals. The Paper envisaged that around half of the CO<sub>2</sub> reductions expected for the national target of 60% carbon emission reductions by 2050 will be met by cuts in energy demand. However, energy efficiency policies to date, while welcome, are insufficiently ambitious, coherent or focused on the key outcome – reducing the total demand for energy.

In 2002, the Cabinet Office’s Performance and Innovation Unit assessed the economic potential for energy saving in all sectors (see table below).<sup>18</sup> Savings amounted to approximately 30% of final demand, with benefits in reduced costs to consumers (net of taxes) of £12 billion annually.

	Summary of economic potential for energy saving		
	Energy (Mtoe/yr)	Per cent savings (of final UK energy demand)	Estimated savings (£m/year)
Domestic	17.4	37.2%	5,000
Service	3.8	21.0%	1,190
Industry	8.6	23.8%	1,380
Transport	19.3	35%	4,700
Total	49.1	31.4%	12,300

The following sections discuss policies which could help to realise this enormous potential.

---

<sup>18</sup> The Energy Review – A Performance and Innovation Unit (PIU) Report, February 2002.

Energy services companies (ESCOs)

WWF's vision for a sustainable power sector focuses on achieving a transformation of the major power companies from electricity and gas suppliers **to energy service providers**. The companies would make profits from the provision of energy services to their customers (large industrial, medium business or domestic), through a focus on energy efficiency decentralised generation powered by renewables and CHP. Under this new business model, the company would place a strong emphasis on managing demand in collaboration with its customers by developing efficiencies and reducing wasteful energy activities.

To achieve this market/industry transformation the Government needs to:

- recognise that for this viable alternative business model to prosper and deliver its full potential, reforms to the regulatory and market framework will be required to force a shift away from the current commodity sales model;
- encourage leadership from the power industry; and
- improve investor and consumer awareness.

The Energy Savings Trust recently recommended that the existing Energy Efficiency Commitment on domestic energy suppliers should be replaced by a supplier cap and trade scheme. WWF supports this approach, as it would force widespread adoption of the ESCO model by all suppliers. If total energy supply is capped, companies would compete to serve the maximum number of customers while delivering the minimum amount of energy – a win-win situation for all parties, and for the environment.

Related policy measures could flow from the implementation of the EU Energy End Use Efficiency and Energy Services Directive, which could be used to focus the energy supply industry's attention on reducing demand, and hence carbon emissions and to commit to mandatory energy demand reduction targets.

Energy efficiency in households

WWF believes it is important the Government takes further steps now to ensure that the benefits which **energy services** can provide to domestic consumers and homes are captured in the mid to long term. However, in the short term the Government should also implement the following measures:

- introduce mandatory assessment of all homes against the Code for Sustainable Homes on sale/purchase/change of occupancy;
- ensure that the highest level of the Code requires zero carbon standards and that this standard is tested by the development of exemplars over the next 4 years;
- introduce stamp duty relief and council tax rebates for homes meeting high Code standards;
- enable local and regional planners to require the use of the Code through PPS3 and the forthcoming PPS on Climate Change;
- invest in publicising the Code to homeowners. Link publicity of the Code to the launch of the Home Information Pack and the new £20million local authority marketing fund for energy efficiency and renewable grants;
- ensure that adequate training and resources are available for Building Control Officers to ensure compliance with the new Part L standards. Make use of new enabling powers under the Sustainable and Secure Buildings Act to better address the energy performance of the existing stock through the Building Regulations; and

- implement new and strong measures to promote the uptake of smart metering in homes and buildings in order to encourage citizens to reduce wasteful energy use and realise where savings lie.

#### **A. The Code for Sustainable Homes**

WWF believes it is vital that the government recognises the importance of energy savings from new build housing, even though it currently only represents around 1% of the total housing stock per annum. EST has demonstrated that new build properties built from now on will make up around 30% of the total housing stock in 30-50 years' time. **Therefore it is vital that all new build meets zero carbon standards as soon as possible if the government is to meet its 60% cut in carbon emissions target by 2050.**

WWF welcomes the recent announcements from the Government that it intends to strengthen the Code for Sustainable Homes. We welcome the proposal to set minimum, non-tradable energy and water efficiency standards for each of the levels, and we hope that they will stretch sufficiently beyond Building Regulations in order to make a meaningful contribution to the UK's fuel poverty and climate change goals. WWF strongly supports the proposal to set the highest level of the Code at 'zero carbon' and believes that planning guidance and fiscal incentives should be put in place to ensure developers reach these higher standards. However, given the need to progress swiftly to zero carbon standards in the Building Regulations, we would question the need for 5 levels.

We also welcome ODPM's statement that the new CSH requirements will form the basis of future improvements to Building Regulations. This will allow developers time to prepare to deliver higher standards over time.

WWF firmly believes that in order for the Code to achieve penetration into the private sector, the Government must introduce mandatory assessment of all new homes, as proposed by Ministers, as well as clear planning guidance to enable planners to require the use of the Code. Over time the requirement for mandatory assessment should be extended to existing homes and other buildings. The Government should set out a clear timetable for requiring Code assessment on both new and existing buildings to allow industry and homeowners time to prepare.

With the introduction of mandatory energy performance certificates for houses as part of the Home Information Pack, the necessary information for energy efficiency for new and existing homes will be readily available. This could easily be extended to a more comprehensive mandatory Code assessment.

#### **B. Fiscal incentives**

WWF believes that new energy efficient homes (for example those that meet the proposed Code level 3 or above – i.e. a 25% improvement in carbon emissions over current Part L standards) should attract stamp duty relief and council tax rebates. For existing stock, the occupants who carry out remedial work which improves their home's Code rating within a period after moving in should also attract stamp duty relief and rebates in council tax. The VAT levels for new build and refurbishment should also be equalised. The government should also extend the "green landlords scheme" to incentivise the take up of energy efficiency measures in the private rented sector.

#### **C. Building Regulations**

WWF welcomed the carbon improvements through the revised Part L of the Building Regulations but we were disappointed the original target of 25% was watered down to 18%. WWF also welcomed the introduction of pressure testing to verify compliance with Part L. It is vital that the government invests in

the necessary training and resources for Building Control Officers to enable them to adequately enforce the new requirements.

WWF was disappointed that the Government failed to introduce measures through Part L which would require “consequential improvements” to energy efficiency to be made when householders in existing homes extend the carbon footprint of their home (e.g. by building a conservatory). WWF firmly believes the Government must introduce the new measures listed above to tackle the poor performance of the existing stock.

WWF is of course delighted that the Secure and Sustainable Buildings Act received Royal Assent in September 2004, but we are disappointed that the Government has so far failed to make sufficient use of the new powers provided. The Act offers several opportunities for improving energy efficiency through the Building Regulations, by allowing them to better address existing stock and require the appointment of a “competent person” onsite to ensure the regulations are met.

Energy efficiency in the business sector

Business is responsible for roughly one-third of the UK’s CO<sub>2</sub> emissions, if emissions from power generation are allocated to end users. According to the PIU’s analysis, there is huge potential to improve efficiency and reduce emissions in business and industry.

Recent work by the Carbon Trust to inform the Government’s energy efficiency innovation review puts forward a package of measures which could reduce CO<sub>2</sub> emissions from business and the public sector by 10% by 2010 and by 20% by 2020.<sup>19</sup> It concludes that these savings could deliver financial benefits using existing energy efficient technology, and turn projected growth in the sector’s emissions into an absolute decline averaging about 1% per year. The policies would include more rigorous implementation of existing policies, such as the building regulations and the EUETS, and a new UK emissions trading scheme.

Significantly, the Carbon Trust concludes that such stronger policy measures “will have little or no impact in terms of competitiveness of UK business except potentially in a few limited cases.” Measures to protect the few vulnerable sectors, such as aluminium and potentially cement and steel, should be considered – but WWF believes that these special cases should not be used to justify lack of ambition in dealing with business in general.

**For energy-intensive industry, the cornerstone of emission reduction policies should continue to be the EUETS.** Recent research for WWF has proposed a range of detailed proposals for improving the effectiveness of the EUETS, which are discussed in our response to question 1. A tough cap on business as a whole is essential to deliver cost-effective emission reductions, although WWF broadly agrees with the Government’s decisions to place the greatest burden on the power generation industry.

The centrepiece of existing UK policies on business emissions is the climate change levy and the associated climate change agreements (CCAs) with energy intensive industry. For less energy intensive sectors, however, the levy is not a material cost and has failed to drive forward energy efficiency. The CCAs could offer a useful mechanism to reduce emissions and improve efficiency. **However, there are several reasons to doubt whether the CCAs are fulfilling their full potential:**

- the fact that for most sectors, targets are not absolute but related to output;

---

<sup>19</sup> The UK Climate Change Programme: Potential evolution for business and the public sector, December 2005.

- the Government's failure to secure significant tightening of CCA targets in negotiations with industry was a major reason why it then sought to increase the UK's allocation for Phase I of the EUETS. WWF finds the failure to secure tougher targets surprising, given the huge net over-achievement against the first CCA milestones and the fact that CCAs offer relief from the climate change levy worth some £300 million per year;<sup>20</sup>
- The lack of transparency surrounding the CCA negotiations is a major concern; and
- Surplus "hot air" allowances from the pilot UK emissions trading scheme will undermine the CCAs. There is compelling evidence that the UKETS – which involved incentive payments of £215 million, mostly to a handful of large companies – offered very little additional reduction in greenhouse gas emissions because of flaws in setting baselines and targets. Recent voluntary action by some of the companies involved will not be sufficient to remove the massive oversupply of allowances.<sup>21</sup>

The Carbon Trust suggests that when the CCAs expire, the sectors covered could be migrated to the EUETS and/or to a proposed new UK ETS. In advance of such a move, however, there is a strong case to revisit the CCAs and set more demanding targets.

The Carbon Trust also proposes that a new UK ETS to address energy use in less energy intensive business. It proposes a simple, mandatory trading scheme to cover emissions, including electricity use, from around 14,000 larger companies and public sector organisations. This instrument would deliver additional carbon savings of 2.2-3.6mtC per year in 2020.

**WWF believes that the Government's failure to endorse the Carbon Trust's proposed UK emissions trading scheme in its climate change programme review is a serious missed opportunity. We hope that the idea will be taken up as a consequence of the energy review.**

Combined heat and power

WWF urges the Government to refocus on CHP to ensure that its long-standing target for 10GW in 2010 is met.. Additional measures need to be put in place urgently, including a possible CHP obligation, and the Government should commit to a further targets of 15GW 2020.

In 2004, the EST published a study on the potential for community heating (CH), which clearly mapped out the very substantial potential across the UK which is far greater than Government's 2010 CHP target.

In 2004, only around 5.7GW of CHP capacity was installed in the UK.<sup>22</sup> However, analysis by the DTI, BRE and Carbon Trust analysis has shown that there is great potential for a further 17GW CHP capacity in the industry and commercial sector and up to 18GW in the residential community heating sector.

WWF strongly recommends that the Government should urgently implement additional policies in order to exploit this huge potential. One option would be to set meaningful targets for CHP, energy services and micro-generation for 2010, 2015 and 2020, as well as provide more funding in the Low Carbon Building Programme out to similar dates, in order to motivate electricity generators, suppliers and estate owners to provide energy services to improve the efficiency of their customers' premises.

---

<sup>20</sup> ENDS Report 367, August 2005, pp 26-28.

<sup>21</sup> ENDS Report, December 2004, pp 15-16.

<sup>22</sup> DTI annual UK energy statistics review (DUKES) 2004.

## Transport

Road transport currently accounts for 22% of total UK CO<sub>2</sub> emissions – but on current trends this looks set to rise to 29% by 2020. The Government has predicted that road traffic will continue to grow by 20-25% to 2010. Similarly, aviation is growing rapidly with passenger numbers predicted to rise nearly three-fold by 2030. There is clearly scope to improve efficiency in road transport, but less so in aviation.

**In both areas effective policies to tackle CO<sub>2</sub> emissions will require action to significantly reduce the rate of growth in demand.** Rapid growth is fuelled by the fact that the real-term cost of motoring and aviation is forecast to decline significantly over the next few decades – while average incomes are expected to increase considerably. Meanwhile, real costs of public transport have increased markedly. This points to the need for fiscal and other measures to ensure that both the full environmental impacts of travel and relative pricing between transport modes are adequately addressed.

So far, however, Government policies to tackle transport emissions have been piecemeal – and the Department for Transport in particular has failed to recognise the need to take urgent and sustained action on climate change.

### **A. Road transport**

There is considerable cost-effective scope for increasing vehicle efficiencies. Existing and almost market-ready technologies could, if supported by appropriate policies, halve emissions from cars, although these do incur rising costs. The lack of strong financial incentives to encourage purchase of to buy less polluting cars is holding back the introduction of cleaner technologies such as hybrids.

Indeed, the fuel economy of new private cars in the UK has deteriorated in recent years, largely because of the fashion for larger, heavier and more powerful cars. Sales for SUVs have increased threefold since 1990 (7% of new registrations in the EU in 2003). In contrast, company car efficiency is improving – albeit at a slow rate – confirming the effectiveness of fiscal incentives for fuel economy. Such incentives need to be made stronger and extended to all cars – **the recent increase in vehicle excise duty differentials was a useful start, but insufficient to make a real difference to purchasing decisions.**

The trend to larger vehicles is contributing to the likely failure by the car industry to meet EU voluntary agreement targets to improve fuel efficiency of new cars. **WWF supports replacing the agreements with mandatory fuel economy standards, underpinned by trading between car manufacturers.**

WWF understands that Ministers have written to the European Commission urging the inclusion of surface transport in future phases of the EUETS. We urge caution in this approach until better understanding is available of its practicality and its impacts on all sectors. **At a minimum, inclusion of surface transport in the EUETS should not be seen as an opportunity to scrap, or dilute, existing policies in this area – including fuel and vehicle taxation.**

The Government is also considering a national scheme for road user charging on existing roads. WWF is concerned that pressure to make this scheme “revenue neutral” will lead to an increase in overall CO<sub>2</sub> emissions from road transport, because reductions in fuel and vehicle taxation will reduce incentives to drive less and to buy more efficient vehicles. Any road charging scheme should be designed to deliver CO<sub>2</sub> emission reductions rather than simply reduce congestion. For example, it could be graded to account for vehicle emissions and/or weight, and be targeted at areas where traffic growth and projected traffic growth is highest.

In addition, the current road building programme should be reviewed to remove schemes that will add to emissions of carbon dioxide and congestion. As part of its strategy to increase efficiencies, Government should also improve its speed management strategy with better enforcement and lower and variable speed limits, including reducing single carriageway limits from 60mph to 50mph. This would yield wider benefits in terms of noise, air pollution and quality of life.

CO<sub>2</sub> emissions from freight transport rose by 48% between 1990-2002. Measures to improve the efficiencies of surface freight transfer are readily available within the limits of existing technology. They should include the regional sourcing of goods, promotion of investment in rail and inland/coastal water freight infrastructure and requiring new industrial development to be sited near existing freight movement links.

## **B. Aviation**

At present, international flights are not included in the UK's greenhouse gas inventory or in the Government's targets. Moreover, aviation's full global warming impacts are thought to be around three times greater than the effect of CO<sub>2</sub> emissions alone. Including the full impact of international flights in the UK's inventory would, on current projections, make it all but impossible to meet the Government goal of cutting emissions by 60% by 2050.

Over the next 30 years, the number of passengers passing through UK airports is set triple from 180 million to 500 million passengers per year. Such an expansion will require a large investment in infrastructure. Yet the growth is fuelled by the fact that the UK aviation industry receives an effective annual subsidy of £9 billion. Moreover, the Government's 2003 aviation White Paper predicts a 1% per year reduction in fares in real terms through to 2030.

**The Government should press for inclusion of the full climate change impacts of aviation in the EUETS as soon as possible. The ETS should cover all international flights – not just flights between EU destinations which account for just 40% of the total emissions.** The aviation sector should be given a tight cap which will deliver an absolute reduction in emissions from current levels, and be required to buy 100% of its allowances at auction.

However, it seems very likely that aviation will not be brought under the ETS until 2013 – nine years after the aviation White Paper. **This makes it essential that early action, for example by domestic taxation, is taken to begin to address the sector's unsustainable growth rate.** The Government must ensure that passengers pay the full environmental cost of their flight via an increase in Air Passenger Duty and a fuel tax on all internal flights. Tax exemptions on VAT and duty free are hidden subsidies and should be removed.

Although large gains have been made in efficiencies of modern passenger air fleets, the impact of further gains made through current R&D on efficiencies within the next 30 years remain questionable as planes flying now are unlikely to retire before that time. Indeed, official emission projections already assume an impressive improvement in efficiency – confirming that the real challenge is to reduce the rapid growth in demand.

Over the next 20 years, growth in freight aviation will exceed passenger growth, rising at a rate of 5-6% per year. Freight aviation has not undergone the same efficiencies and does not face the same restrictions as passenger flights. Many of the older, inefficient passenger aircraft have in fact found new life as freight carriers. The Government should work towards an integrated freight transfer strategy across modes and lobby for EU requirements on freight craft to match current best efficiencies in passenger

craft.

Oii. Implications in the medium and long term for the transmission and distribution networks of significant new build in gas and electricity generation infrastructure.

WWF supports the DTI's recognition that micro-generation technologies and schemes, as well as reducing carbon emissions from the building sector, also have the advantage of producing heat and electricity close to the point of use, and so avoiding the energy losses that occur in the transmission of electricity. Thus helps to reduce the need for investment in new centralised plant and in upgrading transmission and distribution networks.

WWF suggests that the Government and OFGEM develop and implement new measures which increase investment into transforming and upgrading the national grid. Measures should also be taken to reduce the high costs currently faced by offshore renewable developers and local electricity suppliers to connect to the grid, if it exists near to the renewables resource.

A report published recently by the UK Energy Research Centre (UKERC)<sup>23</sup> confirms that variable electricity generation from renewable sources, such as wind, need not compromise electricity transmission grid and system reliability at any level of penetration foreseeable in Britain over the next 20 years. None of more than 200 studies reviewed suggested that introduction of significant levels of intermittent renewable energy would lead to reduced reliability; indeed, a wide geographical spread and a diversity of renewable sources will keep costs down.

According to a report published by Greenpeace in July 2005 the current electricity system is so inefficient that two-thirds of the energy in the fuel is wasted before it gets used at homes and workplaces. The huge wastage – enough to provide heating and hot water for all the buildings in the UK – occurs because an enormous amount of energy is wasted in the large power stations that make our electricity, while more power is lost transporting the energy long distances through power lines.

In related work by PB Power for Greenpeace and the Mayor of London it was found, similar to several other feasibility studies, that the combined contribution of micro-generation, district heating and CHP schemes to reducing carbon emissions could be enormous. For example, according to the study, if half the houses in the UK had combined heat and power boilers, this would generate as much electricity as current nuclear power plants while saving householders money on their electricity bills.

The report<sup>24</sup>, lays out a vision for London that builds on approaches already successfully adopted in Denmark and the Netherlands, where decentralised energy and the utilisation of waste heat provides over 50% and 40% of energy supplies, respectively. . The report examined four different paths London could take to supply its future energy needs and found that a high decentralised energy (DE) scenario could:

- reduce CO<sub>2</sub> emissions from buildings in London by almost 32%;
- reduce London's primary energy demand by up to 35% compared to a scenario involving centralised, new nuclear power;
- reduce London's consumption of gas by up to 15% compared to a nuclear scenario;
- enable London to generate 64% of its own electricity within the city; and

---

<sup>23</sup> Report by the UKERC 'The Costs and Impacts of Intermittency' (April 2006).

<sup>24</sup> Report by PB Power for Greenpeace 'Powering London into the 21<sup>st</sup> Century' (March 2006).

- enable London to generate 43% of its own heat within the city.

Qiii. Opportunities for more joint working with other countries on our energy policy goals.

The most important priority for driving forward our energy policy goals internationally is to secure agreement on a robust international framework for climate change beyond 2012, when the current targets under the Kyoto Protocol expire.

**WWF urges the Government to demonstrate strong international leadership in the climate negotiations, and to ensure that the future framework retains binding absolute caps on emissions from developed nations at its core.** Binding absolute caps are the foundation stones for the rapidly growing global carbon markets – and moving away from them would greatly reduce the drive to improve efficiencies and to develop and implement lower carbon technologies.

The UK should also seek to use its leverage to bring the USA back into the post-2012 framework, and to work with leading developing countries to develop a pathway which would allow them to move towards binding emission caps.

The UK also has an important role in ensuring that EU policies on climate change continue to be robust and effective. In particular, it is vital that the EUETS is successful and rolls out beyond 2012 as it is an excellent model for other nations to follow and could become the benchmark for a future global emissions market.

As discussed in response to Question 2, considerable progress to improve the security of fuel supplies – and particularly of gas – could be made by work to liberalise European energy markets and by pursuing better diplomatic links and bilateral/multilateral agreements with countries with major gas reserves.

Finally, there is also scope for joint working with other countries on developing new technologies with significant long-term potential to reduce carbon emissions, such as hydrogen, fuel cells or solar photovoltaics. International standards and protocols for environmental accreditation of biomass and regulation of carbon capture and storage would also be extremely valuable.

Qiv. Potential measures to help bring forward technologies to replace fossil fuels in transport and heat generation in the medium and long term.

Heat generation

So far, energy policy has been badly distorted by the strong focus on electricity generation. To ensure continued reductions in CO<sub>2</sub> emissions, and to help reduce dependency on imported oil and gas, the Government needs also to promote the use of non-fossil fuels in heat and transport applications.

At present, the main candidates for renewable heat generation are solar thermal, ground source heat pumps and biomass. Progress on these issues is closely linked to the promotion of combined heat and power, microgeneration and energy services, discussed elsewhere in this response.

A recent report by the Carbon Trust<sup>25</sup> concluded that UK biomass resources alone offer potential carbon savings of up to 5.6 MtC per annum, and that using biomass for heating gives the most cost-effective carbon savings at present.

---

<sup>25</sup> Biomass Sector Review – report for the Carbon Trust (October 2005).

WWF sees a strong case for new and additional policies to improve the competitiveness of biomass energy schemes, based primarily on existing biomass wastes and, increasingly, sustainable energy crops. For example, creating a Renewable Heat Obligation (RHO) and accompanying targets for 2010, 2015 and 2020 could require energy suppliers to source a percentage of heating fuel from a range of renewable sources, such as willow, straw, solar power and ground heat.

In a report to Government, the Biomass Task Force<sup>26</sup> concluded that biomass has significant potential contribute to UK CO2 targets and security of energy supply, while benefitting rural economies. However, WWF was disappointed that the Task Force failed to recommend the introduction of a RHO.

#### Transport fuels

Biofuels accounted for just 0.25% of total UK transport fuel sales in 2005. The EU biofuels Directive calls for Member States to reach a 5.75% share for biofuels in transport fuel by 2010. The Government's proposed renewable transport fuel obligation (RTFO), due to come into effect in April 2008, aims of providing a stable support mechanism for biofuels up to, and beyond, 2010. However, the level of the Obligation will be only 5% for the UK in the 2010/11.

However, if the RTFO is to succeed in attracting large scale investors there needs to be a clear indication as to what will happen beyond 2010, looking forward to at least 2015. For example, will target increase gradually to 10%? How long will the RTFO remain in place? These are important questions to be answered the Government wishes to see a shift towards the production of bio-ethanol which involves higher infrastructure costs than that of bio-diesel.

The Government has said that ongoing reporting will take place as part of the RTFO. WWF believes that mandatory greenhouse gas accreditation and wider environmental standards for both domestic and imported biofuels should be introduced by the proposed launch date of 2008. It would be remiss to put in place a biofuels support mechanism that does not guarantee significant greenhouse gas reductions across the whole life cycle of the fuel.

Consideration of the benefits and impacts of energy crops should also integrate wider environmental concerns. The EU is likely to rely heavily on imported biofuels, such as palm oil, soya and bioethanol from sugar cane to meet its targets - raising concerns that subsidies for biofuel production could be used to speed tropical deforestation or promote other environmentally damaging practices in developing countries. The impact on the rural employment and livelihoods both within the EU and in developing countries should be substantiated, and checked through a certification scheme which tracks bioenergy from well to wheel. Mandatory, legally binding, environmental and social certification is needed for both imported and domestically produced biofuels. Certification schemes would necessarily have to be WTO compatible, administratively easy to apply, flexible enough to take account of local conditions, cost effective, metric-based, and independently verifiable. Ideally, the same (or at least similar) standards should apply to all products, whichever their origin.

Stimulating biofuel development requires a cross-sectoral approach by governments, involving environmental, agricultural, forestry, trade & industry, transport and finance departments and a wide range of stakeholders. Biofuel targets must be based on a careful assessment of current and future demand and supply potentials.

---

<sup>26</sup> Biomass Task Force - report to Government, (October 2005).

Finally, biomass is a finite resource which needs to be used wisely to ensure maximum carbon benefits while minimising adverse environmental and social impacts. There is some evidence to suggest that carbon benefits are greatest when biomass is used for heat and/or combined heat and power. WWF urges the Government to ensure that support for biofuels for road transport does not undermine emerging markets for biomass heating.